KURT SAXON'S THE WEAPONEER

The Baltimore Steam Battery

Scientific American—May 25, 1861

See PMJB Vol. 1, page 64

The annexed engraving represents a perspective view, taken from a photograph, of the famous steam battery, about which so much has been said within a few weeks, as being in process of construction by the Messrs. Winans of Baltimore. From a letter by Mr. Thos. Winans, published in the Baltimore papers, it appears that the machine belongs to the city of Baltimore, and that the only ground for connecting the name of the Winanses with it is the fact that it was sent to their shop for repair. It was invented by Charles S. Dickinson, of Cleveland, Ohio, and patented August 9, 1859. Its capabilities and advantages are set forth in the following terms by the inventor:

"As a triumph of inventive genius, in the applications and practical demonstration of centrifugal force (that power which governs and controls the universe, and regulates and impels the motion of planetary bodies around the sun), this most efficient engine stands without a parallel, commanding wonder and admiration at the simplicity of its construction and the destructiveness of its effects, and is eventually destined to inaugurate a new era in the science of war.

Rendered ball proof, and protected by an iron cone, and mounted on a four-wheeled carriage, it can be readily moved from place to place, or kept on march with an army. It can be constructed to discharge missiles of any capacity from an ounce ball to a 25 pound shot, with a force and range equal to the most approved gunpowder projectiles, and can discharge from one hundred to five hundred balls per minute.

For city or harbor defense it would prove more efficient than the largest battery; for use on the battlefield, the musket caliber engine would mow down opposing troops as the scythe mows standing grain; and in sea fights, mounted on low-decke' steamers, it would be capable of sinking any ordinary vessels.

In addition to the advantages of power, continuous action and velocity of discharge, may be added economy in cost of construction, in space, in labor and transportation; all of which

Continued on Page 2

The Art of Weaponry

By Kurt Saxon

MEN have been fascinated by weapons since the first true men selected weapons worth keeping. Sub-men obviously hurled rocks and sticks at game, predators and other sub-men. But objects picked up and used once and then discarded are hardly weapons, except in a legal sense. The true weapon was an object worth keeping and carrying around.

Only when stones and clubs of the right shape and balance were appreciated and kept, could the art of weaponry advance. Only then did man rise above the animals and dominate the earth.

So the appreciation of weapons is an almost instinctive preoccupation of the most practical of our species. Moreover, danger to the system inspires farsighted men to arm themselves and their fellows.

The student of weaponry, as well as the professional weaponeer, is an asset to his culture. The more he knows, the more territory he can defend, either as an individual or by supplying less well-armed friends and neighbors. There is also a strong profit motive in making weapons to sell.

THE WEAPONEER details weapons of all kinds and all eras and explains how they work.

The 1883 gunsmithing course will be of practical interest to modern gunsmiths, gun collectors and those who would like to reproduce or repair the old models. It also shows how the Afghans and Pakistanis make their guns as there is a lot of hand work described. (Now in BLACK POWDER GUNSMITH)

The other 19th Century reprints of weapons developed before and during the American Civil War illustrates the intellectual interest in weaponry by our most respected ancestors.

For those who like medieval weaponry, to reproduce as working models, or as attractive wall hangings to sell, the Popular Mechanics series will be appreciated.

THE WEAPONEEER also details improvised weaponry in the finest tradition of THE POOR MAN'S JAMES BOND. Regardless of the availability of conventional weaponry you can feel secure.

You will be able to defend your home and loved ones with the most outrageous infernal gagetry imaginable. Your territory will be a nightmare of boobytraps, mines and alarm devices.

Suffice it to say that, although the knowledge in THE WEAPONEER is legal, its *application* may be a felony, but that's your lookout.

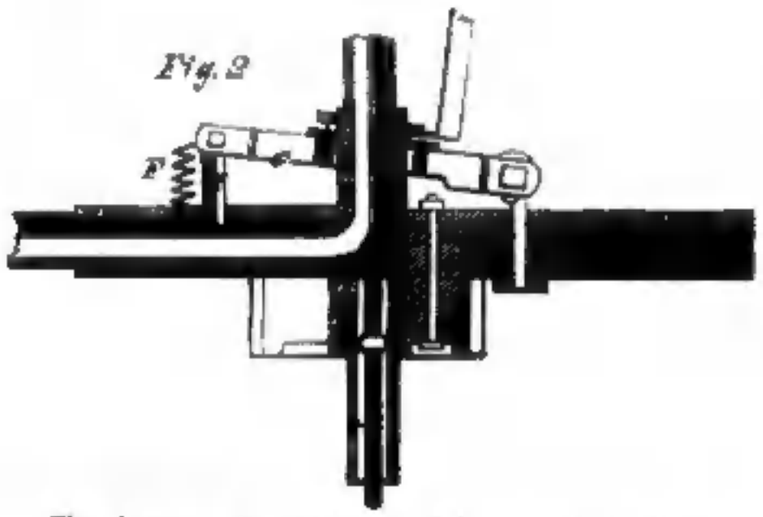
I take no moral stance. I will leave moral considerations up to the individual. Knowledge must be available to anyone who wants it for whatever purpose, whether practical or whimsical. Individuals who cannot be trusted with lethal

would be small in comparison to the cost and working of batteries of cannon, and the equipment and management of a proportionate force of infantry. The possession of this engine—ball proof and cased in iron—will give the powers using it such decided advantages as will strike terror to the hearts of opposing forces, and render its possessors impregnable to armies provided with ordinary offensive weapons.

Its efficiency will soon be practically demonstrated, and the day is not far distant when, through its instrumentality, the new era in the science of war being inaugurated, it will be generally adopted by the Powers of the Old and New Worlds, and, from its very destructiveness, will prove the means and medium of peace."

The construction of the gun is represented in Fig. 2. A steel gun barrell, bent at an elbow as shown, is caused to revolve by steam power with great velocity; when the balls, being fed into the perpendicular portion, which is at the center of revolution, are thrown out of the horizontal arm by centrifugal force. A gate, J, keeps the balls from flying out until the barrel is in the desired position, when this gate is opened by the action of the lever, C, and the balls permitted to escape.

To make sure against accident from the chance issuing of balls when the barrel is not in the proper position, a strong wrought iron casing surrounds the gun, with a slit in one side through which the balls may pass, as shown in Fig. 1. Our cut represents the balls as being fed in singly by hand, but in action it is proposed to feed them in with a shovel. Mr. Winans says that the shot from this gun will cut off a nine inch scantling at the distance of half a mile.



The battery is represented in our engraving as standing in front of messrs. Winans' extensive works in Baltimore, a part of the buildings being represented.

In 1837, Benjamin Reynolds, of Kinderhook, N.Y., constructed a centrifugal war engine for discharging bullets in a stream from a tube. It was operated by two men, one standing at each side working a crank, and turning it in the same manner as two men operate a windlass. The bullets, we understand, were taken from a hopper at the center of a revolving drum and thrown out at the circumference, the action being similar to that of a rotary pump. A small war engine of Mr. Reynolds' was tried at West Point, in 1837, before General Worth and several other officers of the United States Army, and it is stated that, at 110 yards distance from the target, it sent 1,000 2-ounce balls in a minute, through 3¼ inches of hard pine plank.

knowledge should be put away. Responsible citizens must be free to do as they please and not be bound by restrictions normally placed on an irresponsible minority.

I will not play the role of public guardian. I will not hold back information from decent people because a few morons and psychotics might buy the book.

As world civilization crumbles, the Liberal hearts go out to the degenerates causing its fall. The decent citizen is ignored and increasingly disarmed. The predator is favored over his victim.

With THE WEAPONEER, I hope to turn the tide. Let the authorities remove the cancer from our societies, rather than enslaving us on their behalf. If their rights are to be considered above ours, we have no recourse but to go for overkill.

If dangerous parasites are to be favored over good citizens, then good citizens must become even more dangerous. This won't save our system. It's too late. But we will thereby defeat them and thus survive.

ATLAN will proceed to publish material which will enable anyone, regardless of his situation, to defeat any antagonist. I provide knowledge of the weapons needed for any contingency.

My definition of a weapon is any method of overcoming an enemy. It may involve simply outthinking him with a good mind, harrassing him with dirty tricks, thwarting him with legal machinations or eliminating him with deadly force.

Even so, this knowledge is not simply being thrown to the winds. There has at least been an attempt at selection. ATLAN'S goal in THE WEAPONEER is to arm the best in our society against the worst. We will advertise only in adult magazines geared to the thinking of our kind of people.

If you were sent a copy of THE WEAPONEER, it is because you are probably alert to the decline of our system. This alone makes you one of the elite, worthy of being so armed. You either have something of value to offer the next generation or can help destroy those who would be a threat to the next generation.

You may neither have the moxie nor the background to master all the skills in the first twelve issues. But as the course unfolds, you'll so far outstrip your foes that they'll be putty in your hands, if you let them live at all.

If the subject matter seems harsh, you must realize you're living in a harsh world. Moreover, things will get worse before we can make them better. If you are what you hope you are; if you can be what you may have to be to continue, you'll drop your illusions fast. Only realists will be a functional part of the future.

THE BALTIMORE STEAM GUN.

After this it was taken to Washington, and experiments made with it before a committee of Congress and several military officers, with results similar to those obtained at West Point. At this trial the committee exercised great perseverance; first, in regard to its power and range, and, second, in regard to the number of shots projected in a given time.

On this occasion the power applied was as before, one man at each of the two cranks. The target, three thicknesses of one inch pine planks, at the distance of 150 yards. Each ball was projected through the target, falling from three to four hundred yards beyond it into the Potomac River. They were not so successful, however, in determining the number of shots thrown in a given time. In this test sixty balls of 2 oz. were placed in a tin tube of sufficient size and length to contain them. One end of the tube was then placed at the admitting orifice of the battery, into which they were carried by the action of gravity and the exhausting disposition of the machine. The space of time taken for the projection of sixty shots was so small a portion of a second that the committee could not report any specific space of time at all.

The Scientific American — June 1861

ABSURDITY OF STEAM AND CENTRIFUGAL GUNS.

The public mind has been somewhat exercised respecting the steam gun which was captured on its trip from Baltimore to Harper's Ferry, but nothing can be more absurd than the attempts which have been made to apply steam directly and indirectly in projecting bullets—large and small—for purposes of warfare. To project 32-pound balls by centrifugal mechanism, a steam engine of no less than 60-horse power is necessary. With a cannon, we can obtain the same result with eight pounds of gunpowder for every shot. For discharging bullets by steam power, a furnace, a boiler, steam engine and centrifugal machine are required; with gunpowder, the cannon answers for furnace, boiler, engine and projecting machine. How complicated the mechanism by the former method—how simple the latter.

The principles of science lead us to pronounce emphatically against steam when compared with gunpowder, as an expansive agent for projecting shot. The ignition and expansion of gunpowder is almost instantaneous, and it is applied directly to project the missile. The heat of burning fuel used in generating steam is really the primary force in the boiler, just as the heat of the ignited gunpowder is in the cannon. The difference between the instantaneous combustion of the powder and the slow combustion of the coal will convince any person how superior the former is to the latter as a force for projecting missiles of war. The powder is more expensive than coal, but it is no more expensive than it is superlatively effective.

Jacob Perkins(our countryman,residing in London), obtained a patent May 15, 1824. The shell was filled partially with water, and was closed at the rear end with a fusible metal plug. It was placed in a highly heated furnace, and so arranged in connection with a discharging tube that, when it attained to a very high temperature, the plug melted, the steam then flashed out, and, by its reaction, threw the shell out of the tube. It was an attempt to use steam as a substitute for gunpowder in shells, and was a failure. The centrifugal gun of Robert McCarty, of this city, which has been tried two or three times recently at the foot of Thirty-third street, North river, was patented as far back as December 31, 1838. It is essentially composed of a hollow revolving wheel, which discharges its balls through a tube at the periphery by centrifugal action. By applying a steam engine to drive the wheel of this gun, instead of two men working cranks, we really have the Baltimore gun in its most essential features.

On the 21st of December, 1854, A. Smith, D. McKenzie and James Thompson, of England, took out a patent for discharging bullets from a gun by using very high pressure steam as a substitute for powder. The steam was contained in a very strong, small boiler, and was admitted and cut off by a valve to discharge the shot in the same manner that steam is admitted behind a piston in an engine. The boiler was surrounded by a bath of molten metal heated to 1,100° Fah. This was a true, but a very foolish steam gun.

An anecdote is told of the Duke of Wellington to the effect that, after having examined Perkins' steam gun with great attention, and having asked a number of pertinent questions relating to its weight, the means of moving it, getting up steam, &c., he dryly observed, "Well, if steam guns had been invented first what a capital improvement gunpowder would have been." We do not consider that the Duke of Wellington's opinions were infallible respecting inventions, or that he was a man of what may be called "brilliant intellect," but he had a vast fund of plain common sense, and the multitudinous appendages of the steam gun convinced him that it was unfit for the purposes of war. A steam gun could throw a stream of bullets upon the advancing head of a storming column, but with four guns in battery a perfect stream of canister may also be thrown upon an attacking party and produce more destructive results.

REBUTTAL TO "ABSURDITY"

By Kurt Saxon

The principal of hurling missiles by centrifugal force by steam or gas engine is sound. The objection that eight pounds of gunpowder is cheaper than maintaining a 60 horsepower engine is absurd. The average small car of today gives up to 100 horsepower and a large pickup will get up to 400. I suppose a tank would get a couple of thousand horsepower.

So, for today's machinery the centrifugal cannon or machinegun would be very economical, compact and mobile. I don't know why the concept was abandoned, except maybe for the design of the vehicle as shown on page one. Now, anyone could adapt the principal, turning his runabout into a battle wagon of ferocious power.

Survival Shooting

By Ralph Abbott

I am speaking to those of you who are proficient with firearms who would like to learn point shooting.

Point shooting is a method of shooting without the use of sights and is valuable in low light conditions and when you need to get off a shot faster than you can acquire a sight picture, sometimes it is called snap shooting.

Point shooting is as instinctive as pointing your finger but polishing it to precision takes many hours of practice with expensive ammo. Until now.

I have developed a method of teaching point shooting in a very short time without the use of ammunition that you can learn in your living room.

Point shooting is most often used with a pistol but is very effective with a rifle also.

Here is my method:

First of all unload your weapon. Next select a target such as a calendar or picture, stand across the room facing the target in a normal stance, weapon in hand.

Stare at the target long enough to fix the location in your mind, close your eyes, and point the weapon at the target, quickly open your eyes and check the sight allignment.

Off a little? Try again correcting the sight picture each time until y ou can point at a large target every time with your eyes closed.

When you have progressed this far, change to a smaller target. By progressing to smaller targets, you should be able to point to a target the size of a dime in about 3 or 4 weeks of practice.

It is important to practice no more than 10 minutes at a time in order not to become tired, which will throw off your co-ordination. You may practice 2 or 3 times a day but for ten minutes each session.

Do not fire live ammunition until you have practiced long enough to point at the smallest target that your co-ordination will allow. This forces you to use your instinctive abilities and you will be surprised at the results when you do go to a target range or your favorite plinking grounds.

I do not pretend to be a technical expert on firearms or shooting. Paper targets leave me with a case of the blahs and silouette shooting is not my bag. I leave the chickens cackeling and the rams baaing.

What I am is a survival shooter. This means putting meat on the table in every situation which it is possible to encounter with the least waste of either meat or ammunition.

Ralph Abbott
"Country Cousin"

The Nasal Sprayer As a Weapon

Plus: The most effective loads

By Kurt Saxon

For a concealable weapon, as deadly as you want to make it, you can't beat the nasal spray (not mist). Sprays holding antihistamines can be found in any grocery or drug store for about $1.39 or less. Vicks, Dristan and several other brands will give you all you need to fight off or kill any attacker.

They are easily emptied of their legitimate contents and refilled with whatever liquid substance you choose. Simply tilt the spray toward the sink and squeeze repeatedly until empty.

Since the contents are non-toxic you might use the original medicine to practice on a target across the room.

To refill, just put the poison you like best in a bowl, squeeze the emptied sprayer and stick it's nozzle under the liquid. Release the pressure and a lot of liquid will be sucked up.

If it doesn't seem to want to suck in, just hold it by it's sides and squeeze and that will force the flat front and back to draw up the liquid. It might take a few squeezings to get it completely filled. When nearly full, hold it up to a light and squeeze until a drop appears to be coming out of it's nozzle. Then poke it down into the liquid and release the pressure and it will be completely full.

Most nasal sprays have screw caps which take about two full turns to remove. If you have time, this is fine. But if you are stopped by a mugger he might not give you time to unscrew the thing.

So if you are in a really unsafe area, carry it uncapped in your hand. You might also carry it uncapped in your shirt pocket. But be careful to have something else in your pocket to prevent it from tipping over.

The beauty of such a weapon is that it will pass a search unless the searcher suspects it, but only if the searcher believes you to be more clever than you are, which is unlikely. No one is going to suspect a common nasal inhaler in your pocket.

You can even take the deadliest load on a commercial airliner without being detected. However, when going up in a small plane, make sure the inhaler is completely full. If it is only partly full, the air inside will expand and cause it to leak. So watch that!

The best all purpose load is Formaldehyde. It is highly volatile and penetrating. When sprayed into an attacker's face it causes terrible pain in the eyes, nose and mouth. The victim is totally out of action for about thirty minutes. It will stop the strongest man. Unless he has a gun pointed directly at you and pulls the trigger by reflex, one shot in the face with Formaldehyde will allow you to disarm him or walk away without any danger to yourself.

I recently ordered a gallon of Formaldehyde from my drug store and got it, no questions asked, for $7.50. Most pharmacists will order various chemicals for you if they know you and know you will be around to collect it.

If they ask what you want a chemical for, it is usually just out of idle curiosity. Or possibly it is to establish the fact that you have a practical use for it and aren't ordering something you don't understand. Otherwise, the guy wants to make a sale and unless you look wierd, he doesn't care.

So when ordering a chemical not usually stocked on the druggist's shelves, make up a simple cover story. Look the chemical up in a chemistry book or encyclopedia and find it's uses. Choose a common use and tell your druggist that is what you want it for. For instance, you might tell him you want Formaldehyde to preserve lab specimens. This is com-

Imitation Arms and Armor

Popular Mechanics—1913

PART I

Genuine antique swords and armor, as used by the knights and soldiers in the days of old, are very expensive and at the present time practically impossible to obtain. The accompanying illustration shows four designs of swords that anyone can make, and if carefully made, they will look very much like the genuine article.

The drawings are so plain that the amateur armorer should have very little difficulty, if any, in building up his work from the illustrations, whether he requires a single sword only, or a complete suit of armor, full size.

Fig. 1

Fig. 2

Fig. 3

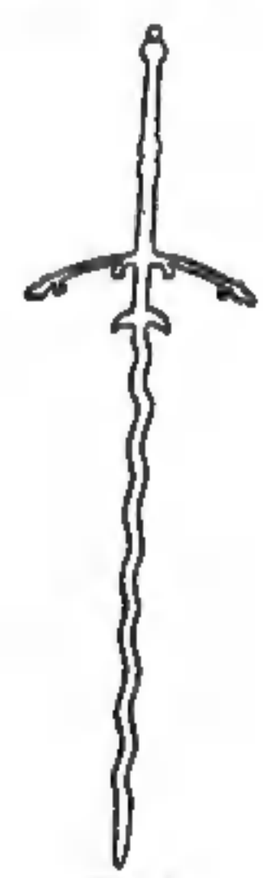


Fig. 4

The pieces or designs in this article are from authentic sources, says the English Mechanic, so that where names are given the amateur can so label them, and will thereby greatly add to their interest and value.

An executioners' sword of the fifteenth century is shown in Fig. 1. The blade should be about 27 in. long with a handle of sufficient length to be grasped by both hands. The width of the blade near the handle is about 2½ in., tapering down to 1½ in. near the point end. Several ridges are cut around the handle to permit a firm grip. The cross guard is flat and about 1 in. in width.

Mark out the shape and size of the blade on a piece of wood ⅛ in. thick, using a straightedge and a pencil, and allowing a few inches more in length on which to fasten the handle. Cut out the wood with a scroll saw or a keyhole saw, trim the edges down thin and smooth both surfaces with fine sandpaper. The end for the handle is cut about 1 in. wide and 2 in. long. The cross guard is cut out and a hole made in the center through which to pass the handle end of the blade. The handle is next made, and if the amateur does not possess a lathe on which to turn the shape of the handle, the ridges around the wood may be imitated by gluing and tacking on pieces of small rope. The handle is then mortised to receive the 1 by 2-in. end of the blade. The cross guard is now glued and placed on the blade, then the hole in the handle is well glued with glue that is not too thick and quite hot. The blade with the cross guard is inserted in the handle and allowed to set. When the glue is thoroughly dry, remove the surplus with a sharp knife and paint the handle with brown, dark red, or green oil paint. The blade is covered with tinfoil to give it the appearance of steel. Secure some pieces of tinfoil and cut one strip ½ in. wider than the blade and the other ¼ in. narrower. Quickly paint the blade well with thin glue on one side, then lay evenly and press on the narrow strip of tinfoil. Glue the other side of the blade, put on the wider strip of tinfoil and glue the

mon and so should arouse no suspicion.

If your druggist does not care to put in special orders and you have no other source for Formaldehyde, you can make up some acrolein or capsicum from easily gotten materials. PAGE 5 PAGE 18.

It may be that you admired Charles Bronson in "Death Wish", wherein our hero actually killed all the muggers he could. After all, why simply incapacitate a brute only to have him lay for you at a later time?

The best instant killer is Prussic Acid. You can make it easily by following the directions on page 50 of The Poor Man's James Bond, Vol. 1.

Although anyone with easily obtained lab gear can make Prussic Acid, you may want a simpler poison. One such as Black Leaf 40 which is Nicotine Sulphate, bought at your local garden store. To use this properly, you need DMSO (Dimethyl Sulfoxide). DMSO is a chemical claimed to be of use in relieving the pain of arthritis. It penetrates the skin and takes any water soluable chemical into the blood stream in seconds.

If a garden herbicide or insecticide has a warning not to be left on the skin, you can be sure DMSO will take it into the blood stream twice as fast as it would orindarily go, fatally.

A diabolical use for DMSO and the poison of your choice is to spread it on your opponent's steering wheel. It dries in about 30 minutes and is not noticeable.

After driving a while, he would apparently have a stroke or heart attack. There is little likelihood that there would be an autopsy, especially if he wrecked the car. Even so, who could prove anything?

DMSO is illegal in most states because of the FDA's doubts of it's safety. Even so, it is advertised for over $20.00 a pint in various periodicals such as THE SPOTLIGHT. You can get it from any veterinarian for about $10.00 a pint. Just tell the vet you have an old dog or horse who has arthritis. That is what the vets use and sell it for. It is sold at the Harrison Health Food Store. Try yours.

To make your lethal load of Black Leaf 40-DMSO, just pour out a 2 ounce bottle of Black Leaf 40 into a saucer and let it evaporate to half it's volume or one ounce. Then mix it with an equal amount of DMSO. You now have two ounces of liquid, a good squirt of which is guaranteed to kill in three minutes.

But maybe you are in a hurry. Try Potassium Cyanide in saturation. That is when you put so much Cyanide in a stoppered test tube with water and after shaking vigorously (the test tube) there is still some cyanide left at the bottom. This means the water cannot hold any more in solution.

In case you can't get Cyanide, you can make all you want from the recipe on page 82 of PMJB Vol. 1.

Mix the Cyanide solution with an equal volume of DMSO. A hefty squirt of this is guaranteed to kill in two minutes.

Okay, so you squirt an opponent with one of the above and he kicks you to death before he dies. Don't worry; I'm ahead of you.

What you do is mix one-third poison, one-third DMSO, and one-third Formaldehyde. The one-third Formaldehyde will put an attacker out of action as surely as if you had dunked his head in a bucket of it. His pain will soon be over.

If you think the one-third poison isn't enough, you now have time to empty the inhaler on him. But all kidding aside, one or two good squirts in the face will do the job.

So now you have the ultimate weapon for defense against an attacker. But maybe you want to put someone away without your victim or anyone else knowing. Do you remember that Belgian who got stabbed in the flank by a Russian agent with a sharp umbrella? A tiny metal pellet left in his body did him in. Three days later he developed what was believed to be pneumonia and died.

A couple of little-bitty holes were drilled in the little metal ball and filled with ricin. Enough ricin to cover the head of a straight pin is fatal in three days.

You don't need the sharp umbrella or even the little metal ball. All you need is the ricin and I'll show you how to make it on page 23.

from page 4

overlapping edge and press it around and on the surface of the narrow strip. The cross guard must be covered with tinfoil in the same manner as the blade. When the whole is quite dry, wipe the blade with light strokes up and down several times, using a soft and dry piece of cloth. The sword is then ready to hang in its chosen place as a decoration, not for use only in cases of tableaux, for which this article will be especially useful to those who are arranging living pictures wherein swords and armor are part of the paraphernalia.

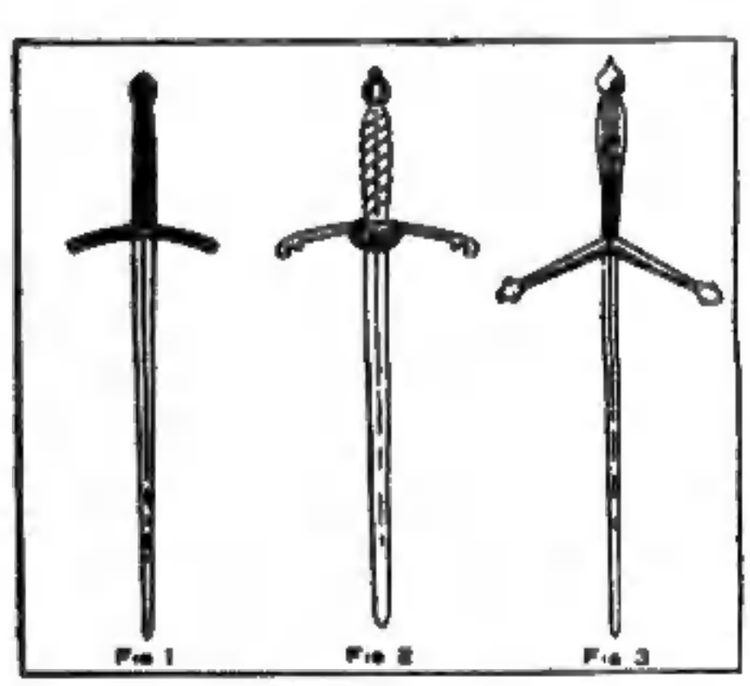
A Chinese scimitar is shown in Fig. 2. The handle of this sword is oval and covered with plaited cord. In making this scimitar, follow the directions as for Fig. 1, except that the handle has to be covered with a round black cord. If it is found difficult to plait the cord on the handle as in the illustration, wind it around in a continuous line closely together, and finish by fastening with a little glue and a small tack driven through the cord into the handle. The pommel is a circular piece of wood, ⅛ in. thick and 5 in. in diameter. The length of the handle, allowing for a good hold with both hands, should be about 9 in., the length of the blade 28 in., the width near the pommel 1½ in. and 3 in. in the widest part at the lower end. The sharp or cutting edge is only on the short side, the other is flat or half-round.

A Turkish sabre of ancient manufacture from Constantinople is shown in Fig. 3. The handle is painted a dull creamy white in imitation of ivory. The enamel paint sold in small tins will answer well for this purpose. The cross guard and blade are covered as described in Fig. 1. The sharp edge is on the longer curved side, the other is flat or half-round.

A two-handed sword used in the 14th and 15th centuries is shown in Fig. 4. This sword is about 68 in. long, has a cross guard and blade of steel with a round wood handle painted black. The ball or pommel on top of the handle is steel. Both edges of the blade are sharp. This sword is made in wood the same as described for Fig. 1.

PART II

Imitation swords, stilettos and battle-axes, put up as ornaments, will look well if they are arranged on a shield which is hung high up on a wall of a room or hall, says the English Mechanic, London. The following described arms are authentic designs of the original articles. A German sword of the fifteenth century is shown in Fig. 1. This sword is 4 ft. long with the crossguard and blade of steel. The imitation sword is made of wood and covered with tinfoil to produce the steel



Three Fifteenth Century Swords

color. The shape of the sword is marked out on a piece of wood that is about ⅛ in. thick with the aid of a straightedge and pencil, allowing a little extra length on which to fasten the handle. Cut the sword out with a saw and make both edges thin like a knife blade and smooth up with sandpaper. The extra length for the handle is cut about 1 in. in width and 3 in. long. The handle is next carved and a mortise cut in one end to receive the handle end of the blade. As the handle is to represent copper, the ornamentations can be built up of wire, string, small rope and round-headed nails, the

whole finally having a thin coat of glue worked over it with a stiff bristle brush and finished with bronze paint.

The crossbar is flat and about 1 in. in width. Cut this out of a piece of wood and make a center hole to fit over the extra length on the blade, glue and put it in place. Fill the hole in the handle with glue and put it on the blade. When the glue is thoroughly dry, remove all the surplus with a sharp knife. Sheets of tinfoil are secured for covering the blade. Cut two strips of tinfoil, one about ½ in. wider than the blade and the other ¼ in. narrower. Quickly cover one side of the blade with a thin coat of glue and evenly lay on and press down the narrow strip of tinfoil. Stick the wider strip on the other side in the same way, allowing equal margin of tinfoil to overlap the edges of the blade. Glue the overlapping edges and press them around on the surface of the narrow strip. The crossguard must be covered in the same manner as the blade. When the whole is quite dry, wipe the blade up and down several times with light strokes using a soft rag.

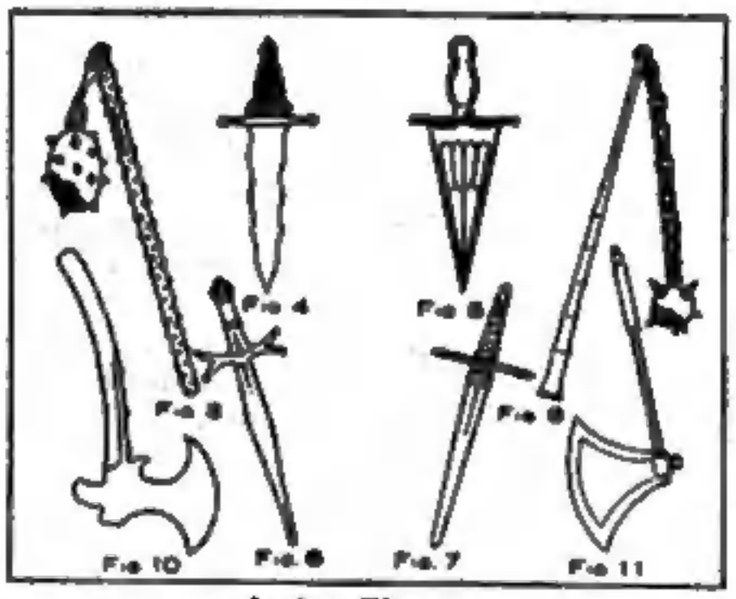
The sword shown in Fig. 2 is a two-handed Swiss sword about 4 ft. in length, sharp on both edges with a handle of dark wood around which is wound spirally a heavy piece of brass or copper wire and held in place with round-headed brass nails. The blade and crossbar are in imitation steel. The projecting ornament in the center of the crossguard may be cut from heavy pasteboard and bent into shape, then glued on the blade as shown.

In Fig. 3 is shown a claymore, or Scottish sword of the fifteenth century. This sword is about 4 ft. long and has a wood handle bound closely around with heavy cord. The crossbar and blade are steel, with both edges sharp. A German poniard is shown in Fig. 4. This weapon is about 1 ft. long, very broad, with wire or string bound handle, sharp edges on both sides. Another poniard of the fourteenth century is shown in Fig. 5. This weapon is also about 1 ft. long with wood handle and steel embossed blade. A sixteenth century German poniard is shown in Fig. 6. The blade and ornamental crossbar is of steel, with both edges of the blade sharp. The handle is of wood. A German stiletto, sometimes called cuirass breakers, is shown in Fig. 7. This stiletto has a wood handle, steel crossbar and blade of steel with both edges sharp.

In Fig. 8 is shown a short-handled flail, which is about 2½ ft. long with a dark handle of wood, studded with brass or steel nails. A steel band is placed around the handle near the top. The imitation of the steel band is made by gluing a piece of tinfoil on a strip of cardboard and tacking it to the handle. A large screweye is screwed into the top of the handle. The spiked ball may be made of wood or clay. Cover the ball with some pieces of linen, firmly glued on. When dry, paint it a dark brown or black. A large screweye must be inserted in this ball, the same as used on the end of the handle, and both eyes connected with a small piece of rope twisted into shape. The rope is finished by covering with tinfoil. Some short and heavy spike-headed nails are driven into the ball to give it the appearance shown in the illustration.

A Russian knout is shown in Fig. 9. The lower half of the handle is of wood, the upper part iron or steel, which can be imitated by covering a piece of wood that is properly shaped with tinfoil. The whole handle can be made of wood in one piece, the lower part painted black and the upper part covered with tinfoil. A screweye is screwed into the upper end. A length of real iron or steel chain is used to connect the handle with the ball. The ball is made as described in Fig. 8. The spikes in the ball are about 1 in. in length. These must be cut from pieces of wood, leaving a small peg at the end and in the center about the size of a No. 20 spike. The pegs are glued and inserted into holes drilled into the ball.

In Fig. 10 is shown a Sclavonic horseman's battle-axe which has a handle of wood painted dark gray or light brown; the axe is of steel. The blade is cut from a piece of ¼-in. wood with a keyhole saw. The round part is made thin and sharp on the edge. The thick hammer side of the axe is built up to the necessary thickness to cover



Ancient Weapons

the handle by gluing on pieces of wood the same thickness as used for the blade, and gradually shaping off to the middle of the axe by the use of a chisel, finishing with sandpaper and covering with tinfoil. Three large, round-headed brass or iron nails fixed into the front side of the handle will complete the axe.

At the beginning of the sixteenth century horseman's battle-axes shaped as shown in Fig. 11 were used. Both handle and axe are of steel. This axe is made similar to the one described in Fig. 10. When the woodwork is finished the handle and axe are covered with tinfoil.

PART III

Maces and battle-axes patterned after and made in imitation of the ancient weapons which were used from the fourteenth to the sixteenth century produce fine ornaments for the hall or den, says the English Mechanic. The imitation articles are made of wood, the steel parts represented by tinfoil stuck on with glue and the ornaments carved out with a carving tool.

An English mace used about the middle of the fifteenth century is shown in Fig. 1. The entire length of this weapon is about 24 in.; the handle is round with a four-sided sharp spike extending out from the points of six triangular shaped wings. Cut the handle and spike from one piece of wood and glue the wings on at equal distances apart around the base of the spike. The two bands or wings can be made by gluing two pieces of rope around the handle and fastening it with tacks. These rings can be carved out, but they are somewhat difficult to make. After the glue is dry, remove all the surplus that has been pressed out from the joints with the point of a sharp knife blade and then sandpaper the surface of the wood to make it smooth. Secure some tinfoil to cover the parts in imitation of steel. A thin coat of glue is quickly applied to the surface of the wood and the tinfoil laid on evenly so there will be no wrinkles and without making any more seams than is necessary. The entire weapon, handle and all, is to appear as steel.

An engraved iron mace of the fifteenth century is shown in Fig. 2. This weapon is about 22 in. long, mounted with an eight-sided or octagonal head. It will be easier to make this mace in three pieces, the octagonal head in one piece and the handle in two parts, so that the circular shield shown at the lower end of the handle can be easily placed between the parts. The circular piece or shield can be cut from a piece of wood about ¼ in. thick. The circle is marked out with a compass. A hole is made through the center for the dowel of the two handle parts when they are put together. A wood peg about 2 in. long serves as the dowel. A hole is bored in the end of both handle pieces and these holes well coated with glue, the wood peg inserted in one of them, the shield put on in place and handle parts put together and left for the glue to set. The head is fastened on the end of the handle with a dowel in the same manner as putting the handle parts together.

The head must have a pattern sketched upon each side in pencil marks, such as ornamental scrolls, leaves, flowers, etc. These ornaments must be carved out to a depth of about

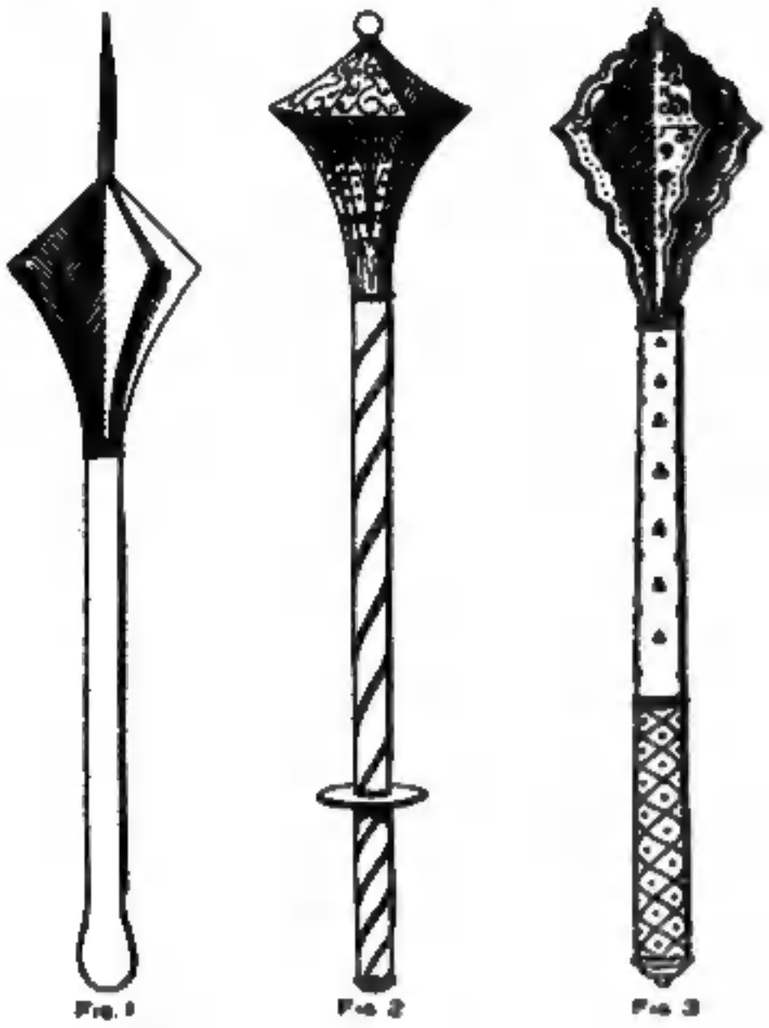


Fig. 1 Fig. 2 Fig. 3

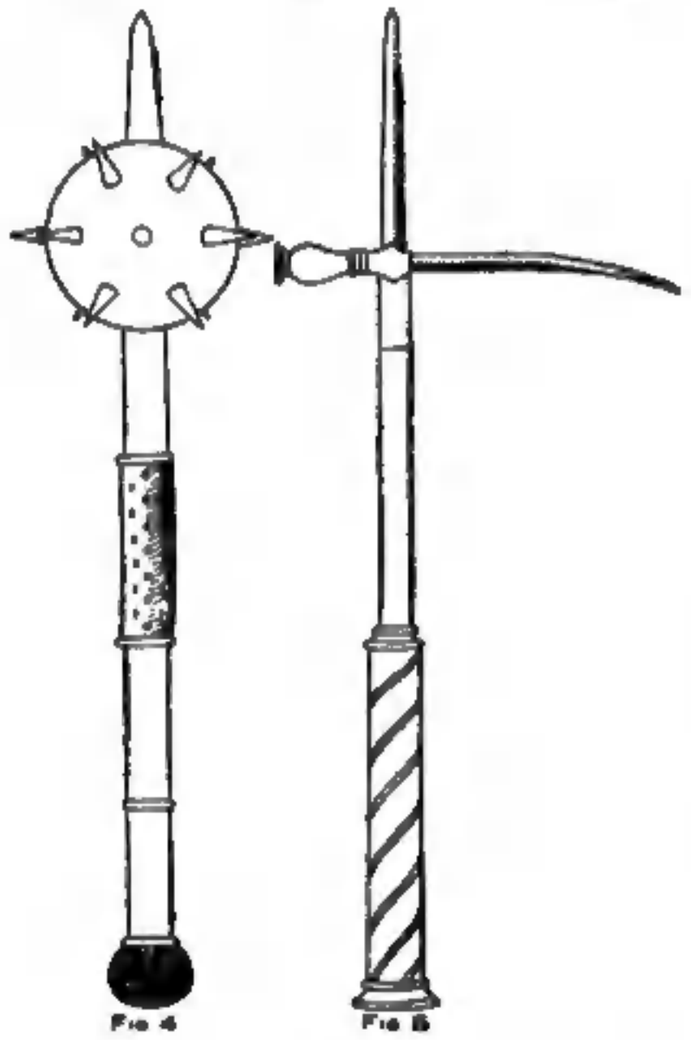


Fig. 4 Fig. 5

Ancient Weapons

¼ in. with a sharp carving tool. If such a tool is not at hand, or the amateur cannot use it well, an excellent substitute will be found in using a sharp-pointed and red-hot poker, or pieces of heavy wire heated to burn out the pattern to the desired depth. The handle also has a scroll to be engraved. When the whole is finished and cleaned up, it is covered with tinfoil in imitation of steel. The tinfoil should be applied carefully, as before mentioned, and firmly pressed into the engraved parts with the finger tips or thumb.

A French mace used in the sixteenth century is shown in Fig. 3. This weapon is about 22 in. long and has a wood handle covered with dark red cloth or velvet, the lower part to have a gold or red silk cord wound around it, as shown, the whole handle finished

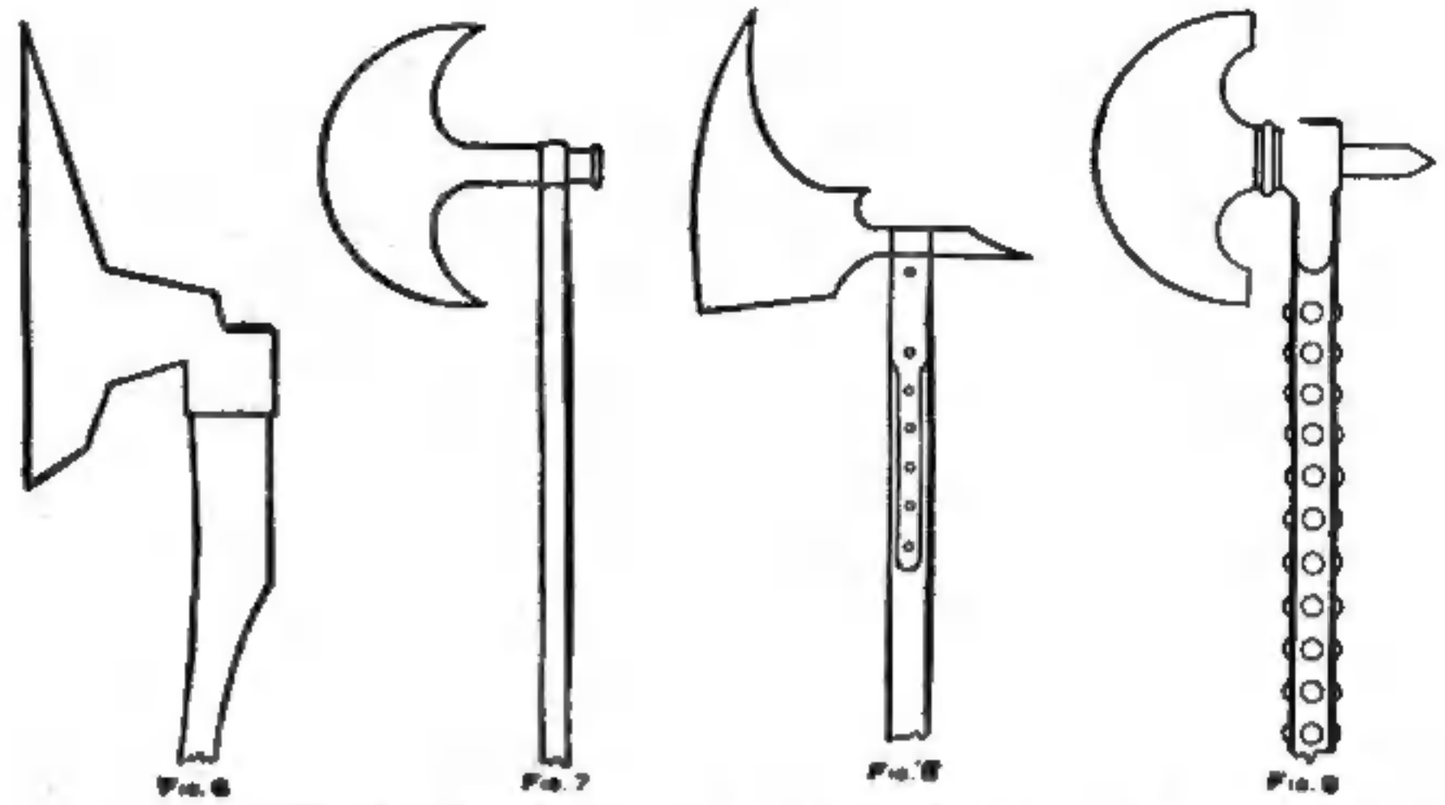


Fig. 6 Fig. 7 Fig. 8 Fig. 9

Battle Axes of the Fourteenth, Fifteenth and Sixteenth Centuries

off with small brass-headed nails. The top has six ornamental carved wings which are cut out, fastened on the handle and covered with tinfoil, as described in Fig. 2.

Figure 4 shows a Morning Star which is about 26 in. long. The spiked ball and the four-sided and sharp-pointed spike are of steel. The ball may be made of clay or wood and covered with tinfoil. The spikes are cut out of wood, sharp-pointed and cone-shaped, the base having a brad to stick into the ball. The wood spikes are also covered with tinfoil. The handle is of steel imitation, covered in the middle with red cloth or velvet and studded with large-headed steel nails.

A war hammer of the fifteenth century is shown in Fig. 5. Its length is about 3 ft. The lower half of the handle is wood, covered with red velvet, with a golden or yellow cord wound spirally over the cloth. The upper half of the handle is steel, also, the hammer and spike. The entire handle should be made of one piece, then the hammer put on the base of the spike. The spike made with a peg in its lower end and well glued, can be firmly placed in position by the peg fitting in a hole made for its reception in the top of the handle. Finish up the steel parts with tinfoil.

The following described weapons can be constructed of the same materials and built up in the same way as described in the foregoing articles: A horseman's short-handled battle-axe, used at the end of the fifteenth century, is shown in Fig. 6. The handle is of wood and the axe in imitation steel. Figure 7 shows an English horseman's battle-axe used at the beginning of the reign of Queen Elizabeth. The handle and axe both are to be shown in steel. A German foot soldier's poleaxe used at the end of the fourteenth century is shown in Fig. 8. The handle is made of dark wood and the axe covered with tinfoil. Figure 9 shows an English foot soldier's jedburgh axe of the sixteenth century. The handle is of wood, studded with large brass or steel nails. The axe is shown in steel. All of these axes are about the same length.

The ancient arms of defense as shown in the accompanying illustrations make good ornaments for the den if they are cut from wood and finished in imitation of the real weapon. The designs shown represent original arms of the sixteenth and seventeenth centuries. As they are the genuine reproductions, each article can be labelled with the name, adding to each piece interest and value, says the English Mechanic, London.

Each weapon is cut from wood. The blades of the axes and the cutting edges of the swords are dressed down and finished with sandpaper and the steel parts represented by covering the wood with tinfoil. When putting on the tinfoil, brush a thin coat of glue on the part to be covered and quickly lay on the foil. If a cutting edge is to be covered the tinfoil on one side of the blade must overlap the edge which is pasted on the opposite side. The other side is then covered with the tinfoil of a size that will not quite cover to the cutting edge. After laying the foil and allowing time for the glue to dry, wipe the surface with light strokes up and down several times using a soft piece of cloth.

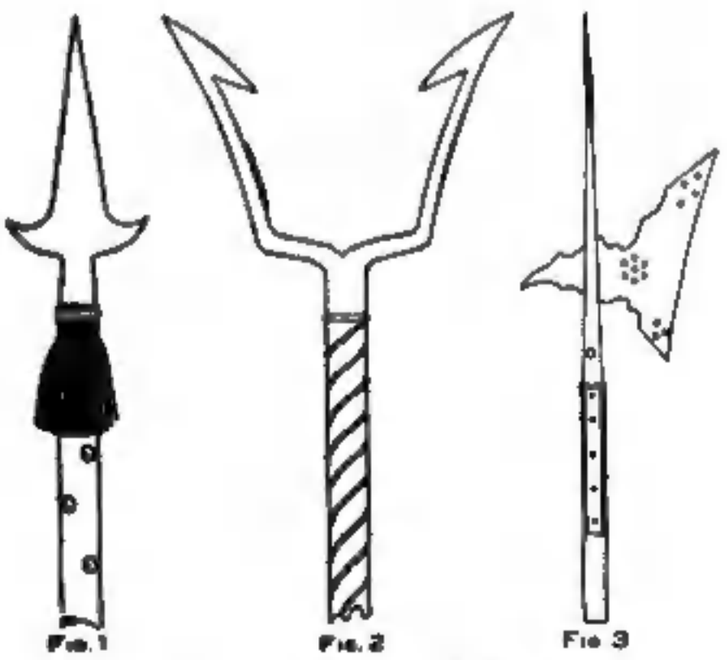
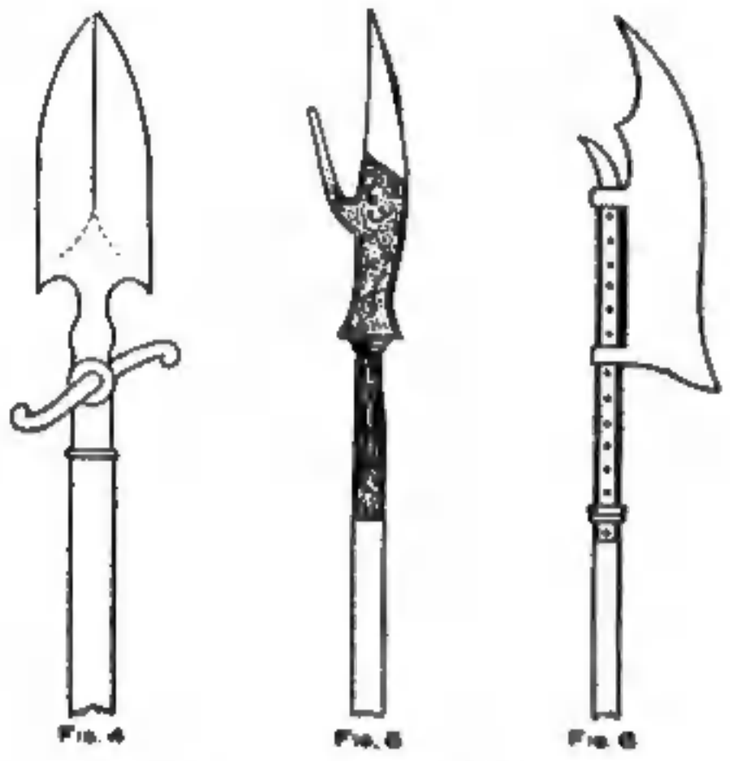


Fig. 1 Fig. 2 Fig. 3

Partisan, Fork and Halberd

A French partisan of the sixteenth century is shown in Fig. 1. The

weapon is 6½ ft. long with a round handle having the same circumference for the entire length which is covered with crimson cloth or velvet and studded all over with round-headed



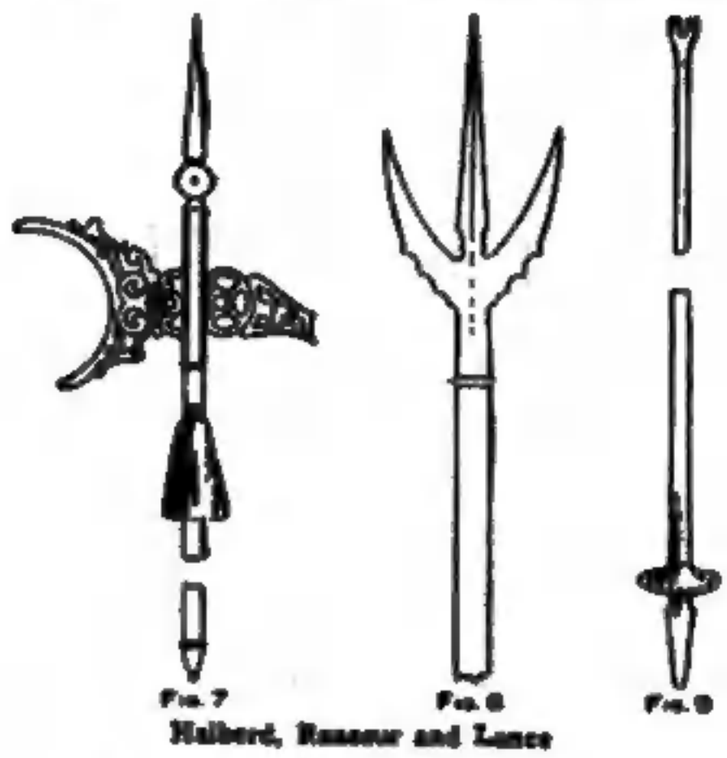
Spontoon, Glaive and Voulge

brass nails. The spear head is of steel about 15 in. long from the point where it is attached to the handle. The widest part of the blade from spear to spear is about 8 in. The length of the tassel or fringe is about 4 in.

Figure 2 shows a German military fork of the sixteenth century, the length of which is about 5 ft. with a handle of wood bound with heavy cord in a spiral form and the whole painted a dark color. The entire length of the fork from the handle to the points is about 10 in., and is covered with tinfoil in imitation of steel.

A Swiss halberd of the sixteenth century is shown in Fig. 3. This combination of an axe and spear is about 7 ft. long from the point of the spear to the end of the handle, which is square. The spear and axe is of steel with a handle of plain dark wood. The holes in the axe can be bored or burned out with red-hot iron rods, the holes being about ¼ in. in diameter.

Figure 4 shows an Austrian officers' spontoon, used about the seventeenth century. It is about 6 ft. long with a round wooden handle. The spear head from its point to where fixed on the handle is about 9 in. long. The edges are sharp. The cross bar which runs through the lower end of the spear can



Halberd, Ranseur and Lance

be made in two pieces and glued into a hole on each side. The length of this bar is about 5 in. The small circular plate through which the bar is fixed can be cut from a piece of cardboard and glued on the wooden spear.

A gisarm or glaive, used by Italians in the sixteenth century, is shown in Fig. 5. The entire length is about 6½ ft. The blade is engraved steel with a length of metal work from the point of the spear to where it joins the handle or staff of about 18 in. It has a round wooden handle painted black or dark brown. The engraved work must be carved in the wood and when putting the tinfoil on, press it well into the carved depressions.

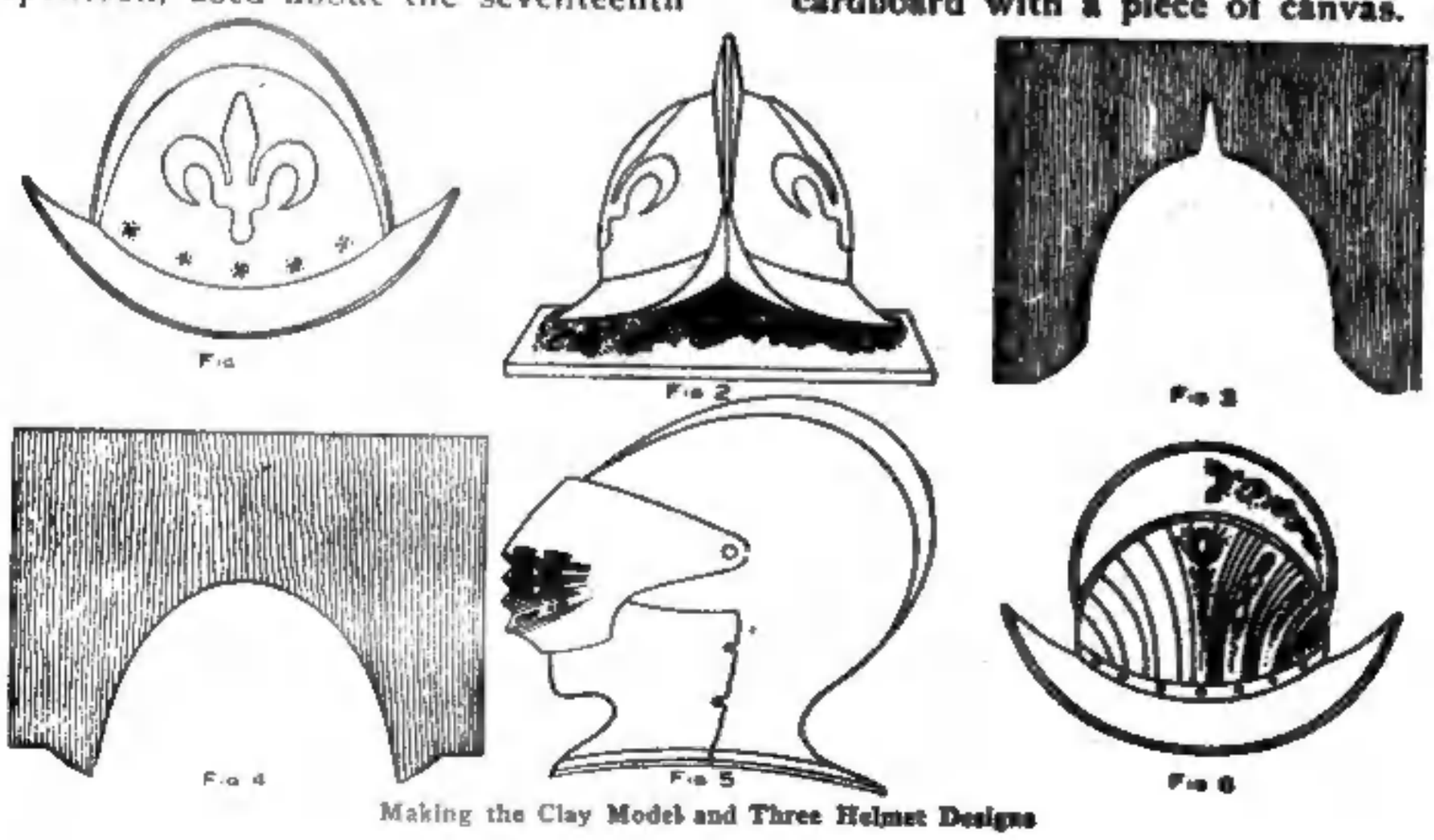
Figure 6 shows a Saxon voulge of the sixteenth century, 6 ft. long, with a round wood handle and a steel axe or blade, sharp on the outer edge and held to the handle by two steel bands, which are a part of the axe. The bands can be made of cardboard and glued on to the wood axe. These bands can be made very strong by reinforcing the cardboard with a piece of canvas. A small curved spear point is carved from a piece of wood, covered with tinfoil and fastened on the end of the handle as shown. The band of metal on the side is cut from cardboard, covered with tinfoil and fastened on with round-headed brass or steel nails.

A very handsome weapon is the German halberd of the sixteenth century which is shown in Fig. 7. The entire length is about 6½ ft., with a round wooden handle fitted at the lower end with a steel ornament. The length of the spear point to the lower end where it joins on to the handle is 14 in. The extreme width of the axe is 16 or 17 in. The outer and inner edges of the crescent-shaped part of the axe are sharp. This axe is cut out with a scroll or keyhole saw and covered with tinfoil.

An Italian ranseur of the sixteenth century is shown in Fig. 8. This weapon is about 6 ft. long with a round staff or handle. The entire length of the metal part from the point of the spear to where it joins the staff is 15 in. The spear is steel, sharp on the outer edges.

Figure 9 shows a tilting lance with vamplate used in tournaments in the sixteenth century. The wood pole is covered with cloth or painted a dark color. At the end is a four-pronged piece of steel. The vamplate can be made of cardboard covered with tinfoil to represent steel and studded with brass nails. The extreme length is 9 ft.

The tassels or fringe used in decorating the handles can be made from a few inches of worsted fringe, about 4 in. long and wound around the handle or staff twice and fastened with brass-headed nails.



Making the Clay Model and Three Helmet Designs

PART V

The preceeding chapters gave descriptions of making arms in imitation of ancient weapons, and now the amateur armorer must have some helmets to add to his collection. There is no limit to the size of the helmet, and it may be made as a model or full sized. In constructing helmets, a mass of clay of any kind that is easily workable and fairly stiff, is necessary, says the English Mechanic, London. It must be kept moist and well kneaded. A large board or several planks, joined closely together, on which to place the clay, will be necessary. The size of this board will depend on the size of the work that is intended to be modeled upon it.

The way to make a helmet is described in the following method of producing a German morion, shown in Fig. 1. This helmet has fleur-de-lis in embossed work, and on each side is a badge of the civic regiment of the city of Munich. The side view of the

helmet is shown in Fig. 1.

The clay is put on the board and modeled into the shape shown in Fig. 2. This is done with the aid of a pair of compasses, a few clay-modeling tools, and the deft use of the fingers. The fleur-de-lis are slightly raised, as in bas-relief. To aid in getting the helmet in correct proportion on both sides, and over the crest on top, cut out the shape from a piece of wood, as shown in Fig. 3, with a keyhole saw. This wood being passed carefully and firmly over the clay will bring it into shape, and will also show where there may be any deficiencies in the modeling, which can then be easily remedied by adding more clay. The cut-out pattern shown in Fig. 4 is the side outline of the helmet.

Scraps of thin, brown, wrapping paper are put to soak in a basin of water to which has been added about a tablespoonful of size melted and well stirred, or some thin glue, and left over night to soak. The paper should be torn in irregular shapes about as large as the palm of the hand. After the clay model is finished, give it a thin coat of oil—sweet or olive oil will answer the purpose very well. All being ready, the clay model oiled, and the basin of soaked paper near to hand, take up one piece of paper at a time and very carefully place it upon the model, pressing it well on the clay and into and around any crevices and patterns, and continue until the clay is completely covered.

This being done, give the paper a thin and even coating of glue, which must be quite hot and put on as quickly as possible. Put on a second layer of paper as carefully as before, then another coating of glue, and so on, until there are from four to six coats of glue and paper. When dry, the paper coating should be quite stout and strong enough for the helmet to be used for ornamental purposes. Before taking it off the model, which should be no difficult matter, owing to the clay being oiled, trim off any ragged edges of paper with a sharp knife, and smooth and finish all over with some fine sandpaper. The paper is then given a thin coat of glue and sections of tinfoil stuck on to give it a finished appearance. When the helmet is off the model, make holes with a small awl at equal distances, through which to insert some fancy brass nails, bending the points over and flat against the inside of the helmet.

A vizor helmet is shown in Fig. 5. This helmet has a movable vizor in the front that can be lifted up, a crest on top, and around the neck a narrow gorget which rests upon the wearer's shoulders. The whole helmet, with the exception of the vizor, should be modeled and made in one piece. The vizor can then be made and put in place with a brass-headed nail on each side. The oblong slits in front of the vizor must be carefully marked out with a pencil and cut through with a knife or chisel.

In Fig. 6 is shown an Italian casque of a foot soldier of the sixteenth century. This helmet may have the appearance of being richly engraved as shown in one-half of the drawing, or, a few lines running down, as seen in the other part of the sketch, will make it look neat. The band is decorated with brass studs.

An Italian cabasset of the sixteenth century is shown in Fig. 7. This helmet is elaborately decorated with fancy and round-headed nails, as shown in the design.

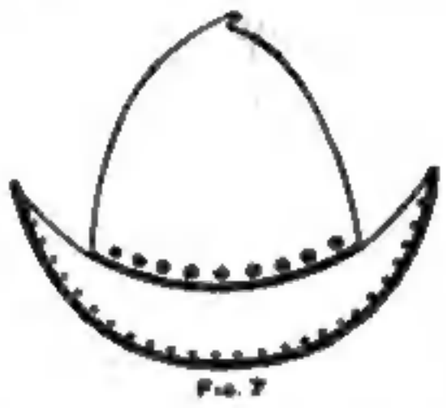


Fig. 7

In Fig. 8 is shown a large bassinet with a hinged vizor which comes very much forward, so as to allow the wearer to breathe freely. This helmet was worn about the sixteenth century, and was probably used for tilting and tournaments.

A burgonet skull-cap of the seventeenth century is shown in Fig. 9. The vizor is composed of a single bar of metal, square in shape, which slides up and down in an iron socket attached to the front of the helmet, and is held in any position by a thumbscrew as shown in the illustration.

A hole in the peak of the helmet allows it to hang in front of the wearer's face. This contrivance should be made of wood, the helmet to be modeled in three pieces, the skullcap, peak and lobster shell neck guard in one piece, and the ear guards in two pieces, one for each side. The center of the ear guards are perforated. All of the helmets are made in the same manner as described for Fig. 1. They are all covered with tinfoil.

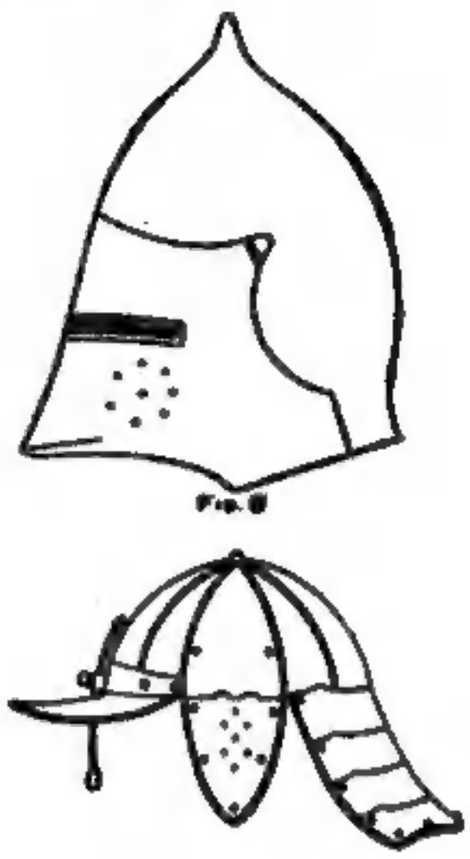


Fig. 8

Fig. 9

PART VI

A mass of any kind of clay that is easily modeled and fairly stiff must be prepared and kept moist and well kneaded for making the models over which paper is formed to make the shape of the articles illustrated in these sketches. A modeling board must be made of one large board or several pieces joined closely together upon which to work the clay, says the English Mechanic, London. The size of the board depends upon the size of the work to be made.

An open chamfron of the fifteenth century is shown in Fig. 1. This piece of horse armor, which was used in front of a horse's head, makes a splendid center for a shield on which are fixed the swords, etc., and is a good piece for the amateur armorer to try his hand on in the way of modeling in clay or papier mache work. The opening for the animal to put his head into is semicircular, and the sides do not cover the jaws. As the main part

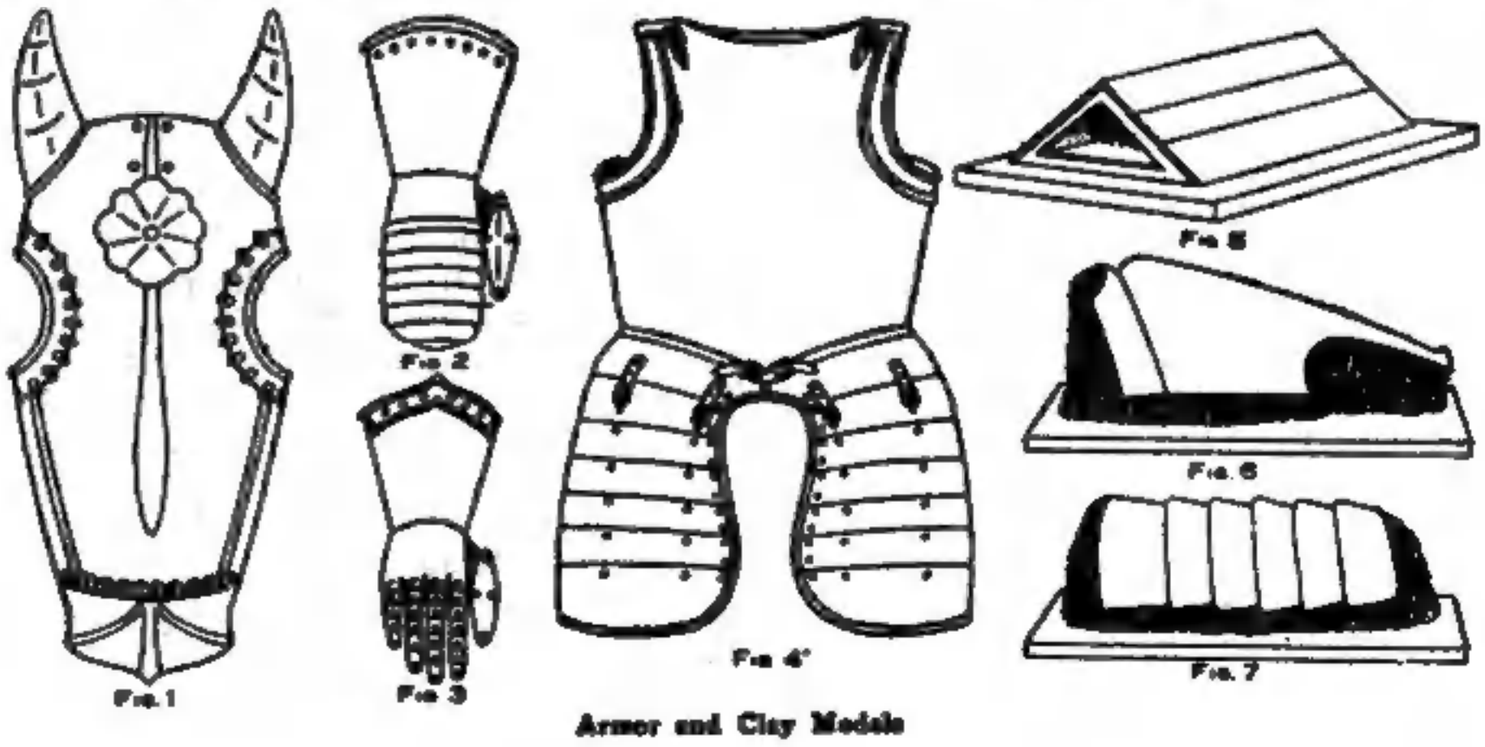


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6 Fig. 7

Armor and Clay Models

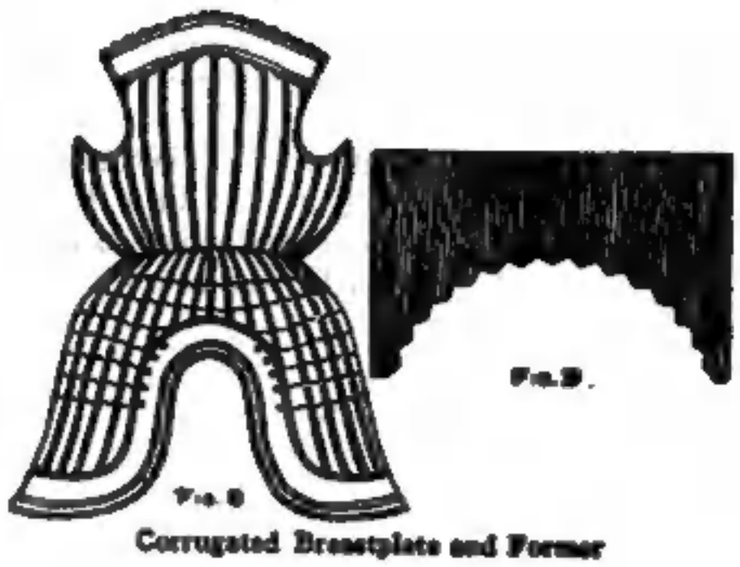
of this armor is worn in front of the head the extreme depth is about 4 in. The entire head piece must be modeled in clay with the hands, after which it is covered with a thin and even coating of sweet or pure olive oil. A day before making the clay model some pieces of thin, brown wrapping paper are torn in irregular shapes to the size of the palm of the hand and put to soak in a basin of water in which a tablespoonful of size has been dissolved. If size cannot be obtained from your local painter, a weak solution of glue will do equally well. All being ready, and the clay model oiled, take up one piece of paper at a time and very carefully place it on the surface of the model, pressing it on well and into and around any crevices and patterns. Continue this operation until the clay model is completely covered on every part. This being done, give the paper a thin and even coating of glue, which must be quite hot and laid on as quickly as possible. Lay on a second layer of paper as carefully as before, then another coat of glue, and so on until there are five or six coats of glue and paper. When this is dry it will be strong enough for all ornamental purposes. The ragged edges of the paper are trimmed off with a sharp knife and the whole surface smoothed with fine sandpaper. Then carefully glue on sections of tinfoil to give the armor the appearance of steel. The armor is now removed from the model.

A mitten gauntlet of the fifteenth century is shown in Fig. 2. This can be made in one piece, with the exception of the thumb shield, which is separate. The thumb shield is attached to the thumb of an old glove which is fastened with round headed nails on the inside of the gauntlet. The part covering the wrist is a circular piece, but the back is not necessary as it would not be seen when the gauntlet is hanging in its place.

In Fig. 3 is shown a gauntlet of the seventeenth century with separately articulated fingers. This gauntlet may be molded in one piece, except the thumb and fingers, which must be made separately and fastened with the thumb shield to the leather glove that is attached to the inside of the gauntlet, the same as in Fig. 2.

A breastplate and tassets of the sixteenth century are shown in Fig. 4. The tassets are separate and attached to the front plate with straps and buckles, as shown in the sketch. There is a belt around the waist which helps to hold the back plate on. Attached to the back of the plate would be two short straps at the shoulder. These are passed through the buckles shown at the top right and left-hand corners of the front plate. For decorative purposes the back plate need not be made, and therefore it is not described. The method of making armor is the same as of making helmets, but as larger pieces are formed it is well to use less clay owing to the bulk and weight.

An arrangement is shown in Fig. 5 to reduce the amount of clay used. This triangular-shaped support, which



Corrugated Breastplate and Former

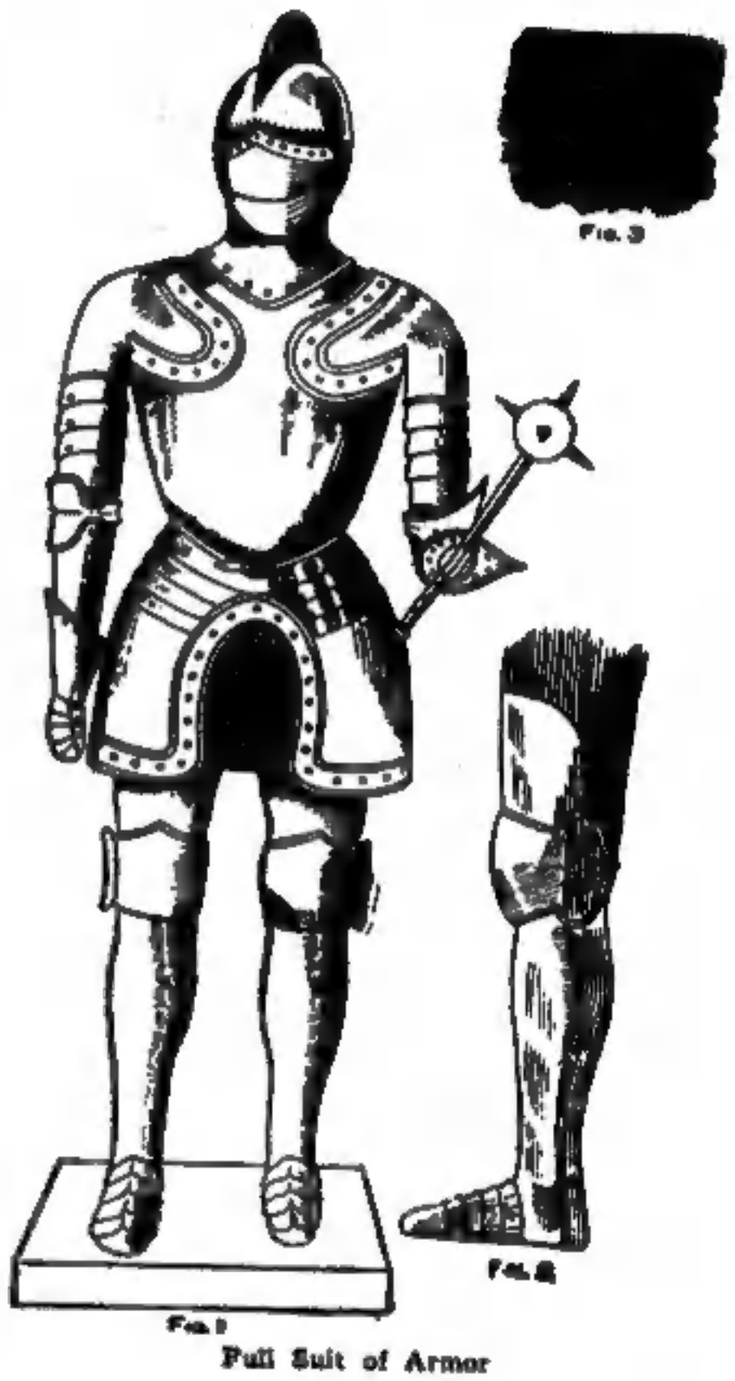
can be made in any size, is placed on the modeling board or bench and covered with clay. This will make the model light and easy to move around, and will require less clay. It is not necessary to have smooth boards; the rougher the better, as the surface will hold the clay. The clay forms modeled up ready to receive the patches of brown paper on the surface are shown in Figs. 6 and 7.

A German fluted armor used at the beginning of the sixteenth century is shown in Fig. 8. The breastplate and tassets of this armor are supposed to be in one piece, but for convenience in making it will be found best to make them separately and then glue them together after they are taken from the model. A narrow leather belt placed around the armor will cover the joint. Fluted armor takes its name from a series of corrugated grooves, ½ in. in depth, running down the plate. A piece of board, cut into the shape shown in Fig. 9, will be very useful for marking out the fluted lines.

PART VII

The helmets, breastplates and gauntlets described in parts V and VI can be used in making up a complete model for a full suit of armor of any size, as shown in Fig. 1. All of the parts for the armor have been described, except that for the legs. Figure 2 shows how the armor is modeled on the side of the left leg. The clay is modeled as described in previous chapters, the paper covering put on, and the tinfoil applied in imitation of steel. The chain mail seen between and behind the tassets is made by sewing small steel rings on a piece of cloth as shown in Fig. 3. These rings may be purchased at a hardware store or harness shop.

The whole figure when completed is placed on a square box covered with red or green baize. The armor should be supported by a light frame of wood built up on the inside, says the English Mechanic, London. Two vertical pieces are firmly attached to the box so they will extend up inside the legs, and at the top of them is attached a crosspiece on which is placed a vertical stick high enough to carry the helmet. The two lower pieces must be built up and padded out with straw, then covered with red cloth or baize to represent the legs.



Full Suit of Armor

In making up the various pieces for a full model it will be found very convenient to use rope, a stout cord or strings in making up the patterns on the parts. Instead of using brass-headed nails, brass paper fasteners will be found useful. These can be purchased at a stationery store. Secure the kind having a round brass head from which hang two brass tongues. These are pushed through a hole and spread out flat on the opposite side. Other materials can be used in the place of tinfoil to represent steel. Silver paper will do very well, but if either the tinfoil or silver paper are found difficult to manipulate, go over the armor with a coat of silver paint put on with a brush. When dry give the surface a coat of varnish.

Mines and Booby Traps

Department of Navy — 1969

ENEMY MINE WARFARE

INTRODUCTION

The history of mine and boobytrap warfare is almost as long as the history of war itself. Although these devices were once considered an unfair and cowardly manner of fighting an enemy, nations continued to develop and employ mines and boobytraps because they provided an effective and simple means of inflicting casualties upon an enemy force.

During the war with France, 1946-1954, the Viet Minh used improvised explosive mines and boobytraps effectively against the French forces. The VC/NVA have continued to improve upon these techniques and are employing mines and boobytraps as an effective weapons system against free world military forces in SVN today. The number of Marine casualties, perhaps better than any other example, illustrates how effective the enemy is with these devices. Marines landed in force in SVN during March 1965 and during the first months of fighting approximately 65-75 percent of all Marine casualties were caused by mines and boobytraps. Much has been learned about the enemy's methods of employing mines and boobytraps since March 1965, but despite this knowledge, Marines, at an alarming rate, continue to become casualties as a direct result of enemy mines and boobytraps. During 1968, 37.7 percent of all Marine casualties were caused by the accidential detonation of a mine or boobytrap. In other words, more than one of every three Marines killed or wounded in SVN becomes a casualty as the result of a mine or boobytrap. Although a great many detection means, ranging from intricate electronic devices to specially trained dogs, have been developed, experience has shown that an alert Marine, aware of what to look for and where to look, is the most effective detection device.

ENEMY DOCTRINE

Although modified by past guerrilla warfare experience in Vietnam, VC/NVA mine warfare doctrine continues to closely parallel that of the Chinese Communist Army. Extensive deliberate minefields have not been encountered in Vietnam. Rather, the enemy employs mines singly or in clusters to achieve his purposes.

In areas occupied and protected by free world forces, the enemy employs mines to delay and disrupt the use of roads and paths and to cause the allies to divert forces to guard and clear those routes. In addition to the threat to military traffic and lawful civilian movement, the free world personnel and equipment employed in patrolling the roads and in detecting and removing mines are prime targets.

In contested areas where friendly offensive operations or patrol activities are conducted, the enemy employs mines and boobytraps to inflict casualties, delay and channelize movement, and damage or destroy equipment.

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ENEMY SOURCES OF SUPPLY

The enemy uses a very limited number of modern machine-produced mines. The majority of enemy mines are handmade by the VC using U.S. duds, discarded ammunition and equipment, and materials thrown away by U.S. forces as trash. Ninety percent of all the material in enemy mines and boobytraps is of U.S. origin (see fig.1). Of all the explosive devices produced locally in VC mine factories, 95 percent are antipersonnel boobytraps.

All dud ammunition is a source of enemy supply. After airstrikes and artillery and mortar missions, enemy salvage teams make sweeps to collect duds. Lighter ordnance is carried away to preparation areas; large bombs and projectiles are broken down and stripped on the spot. In some cases the larger duds are rigged as boobytraps where they have fallen. This is especially true when the enemy feels the strike or fire mission was a preparation for an infantry attack.

Figure 1.--Enemy equipment captured by Marines on sweep operations in ICTZ. Note US M-26 grenade in center of picture. Other grenades are locally produced using C-ration cans.

However, dud ammunition is not the only source of enemy supply. Carelessly discarded ordnance of all sizes and in any quantity is collected by enemy salvage teams. Mortar rounds, rockets, LAAW's, grenades, and small arms ammunition abandoned to lighten the load (or improperly secured and lost by fast-moving Marines) have value as the explosive element in boobytraps. Even a single M16 round ejected to clear a stoppage can be used by the enemy.

Additionally, materials discarded as trash and improperly destroyed such as ration, ammunition, beer and soda cans, batteries, waterproof packaging materials, bandoliers, etc., provide the enemy a valuable source of supply to support his mine warfare operations. These items have, on numerous instances, been employed successfully against Marines and their equipment. Thorough police of friendly

positions upon departure and complete destruction of trash are mandatory to deny the enemy this source of supply.

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VC MINE FACTORIES

Primitive VC mine factories are usually located in the areas they supply. Great care is taken in the camouflage and dispersal of these facilities. Usually constructed underground, effort is made to disperse the workshops and storage throughout a series of tunnels. These limit destruction by working accidents or free world force artillery, air and naval gunfire and protect against discovery. As important as concealment of the mine factory, is the mobility of its personnel and equipment. Even while the mine factory is being settled in one position, new positions are being prepared for rapid displacement. Rarely does a mine factory remain in one place any longer than a few weeks. There is no distinct pattern of movement. Factories have been known to return to previous positions even after that position has been discovered and destroyed by Marine forces.

NVA-trained engineers provide the skilled nucleus for the enemy mine factories, but supervision and labor are primarily VC. The typical output of a local VC mine factory is about 135 mines and explosive devices per month.

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ENEMY TACTICS

ANTITANK AND ANTIVEHICULAR MINING

As we improve in our ability to detect mines, the enemy counters with new twists such as increased use of boobytraps attached to a basic mine to create casualties among mine-clearing personnel; larger mines buried deeper with reduced activation pressure; and pressure electric detonators with offset devices to explode mines under vehicles. Command-detonating mines are normally used in densely populated areas and pressure-type devices in less populated sections. The heaviest mining is along lines of communications near fixed installations.

The enemy makes every effort to avoid repeating practices which, when analyzed, could indicate a pattern. Therefore, the VC/NVA doctrine stresses where to use mines, not how. Listed below are a few of the kinds of places where enemy antitank and antivehicular mines may be found:

- Road junctions and the areas in the vicinity of the road near the junction, with all the mines set to detonate simultaneously.
- Bridges and the approaches 5 to 15 meters from the bridges.
- Old wheel and tread tracks in the road, with care taken to duplicate the track after mine emplacement.
- Underneath roads, tunneling in from the shoulders.
- Potholes in the road.
- Areas recently cleared by free world military forces. The enemy replaces the mines that have been taken out.

ANTIPERSONNEL MINES AND BOOBYTRAPS

Enemy tactics in emplacing antipersonnel mines and boobytraps differ from those used in antitank and antivehicular mining only by where they put them. Locations most commonly used by the VC/NVA to emplace antipersonnel mines and boobytraps are:

- Narrow passages.
- Paddy dikes.
- Trail junctions.
- Hedgerows and tree lines.
- Tunnels and caves.
- Fence lines and gates.
- Tree branches overhanging trails.
- Likely CP sites.
- High ground and ridgelines.
- Shady areas.
- Stream fords.
- Wells and natural watering points on streams and rivers.
- Likely helicopter landing zones.

Remember: Any place a Marine frequently walks, takes cover, rests, or draws water is a likely location for enemy antipersonnel mines and boobytraps.

Physical Protective Countermeasures

The individual Marine can take these steps to reduce the effectiveness of enemy mines:

- Wear body armor and helmet.
- Sandbag vehicle flooring. When possible, place a heavy rubber mat over sandbags to reduce secondary fragments such as shrapnel, sand, stones and pieces of sandbag.
- Keep arms and legs inside vehicles to achieve maximum protection from sandbags.
- Maintain proper distance from other personnel.
- Don't travel alone.
- Don't pick up or touch what appear to be attractive "souvenirs". The VC/NVA prey upon the natural curiosity of Marines and their desire to take home a souvenir.

Beware: That "souvenir" is most likely a boobytrap.

Detection Countermeasures

Once emplaced, a mine or boobytrap must be found before it causes multiple casualties through accidental detonation by a Marine. Unfortunately, too many boobytraps are discovered only after they explode. It is imperative that detection techniques be stressed. Detection may be by:

- Visual inspection. At present, the best mine and boobytrap detector in the Marine Corps is an alert and observant Marine. Each Marine must know the areas in which boobytraps and mines are normally found and be alert for things which "just don't look right." Examples are:

- Mud smears, mudballs, dung, or a board on the road.
- Apparent road repair, new fill or paving patches, ditching or culvert work.
- Wires leading away from the side of the road.

•Tripwires across the trails; along shoulders of roads at likely ambush sites; across the most accessible route through dense vegetation; at fords, ditches and across rice paddy dikes.

•Terrain features which do not appear natural. Cut vegetation dries and changes color; rain may wash away covering material and cause an explosive device to sink leaving a surface depression; a covered device may appear as a mound.

•Suspicious items in trees, branches, or bushes.

•Markings used by VC/NVA to indicate the location of a mine or boobytrap.

● Probing. Suspicious spots must be carefully probed with a probe or bayonet.

● Mine detectors. Mine detectors are designed to assist the individual Marine in a detailed, deliberate sweep of a specific area, usually a road. Particular attention must be given to the time factors of the individual sweeping situation, since overhasty opening of a road can mean an ineffective sweep and quite possibly destruction or injury to vehicular traffic and personnel. The average sweep rate varies from almost nothing to about 5 m.p.h. depending, of course, on the proficiency of the team and the number of contacts encountered. In using detectors, certain considerations must be kept in mind:

•Graveled roads make it difficult for the AN/PRS-4 detector to discriminate between real and false targets.

•Metallic debris, such as can tops, small arms ammunition cases, and metal fragments from artillery rounds fired over roads at night to discourage mine laying, make it difficult for the AN/P153 detector to discriminate between real and false targets.

•The tendency for the enemy to bury mines deeper than designed detection depths, and to deliberately plant metallic debris in the road, calls for additional caution in the use of detectors.

•Operator fatigue. Consideration must be given to the fatigue experienced by operators after 20 minutes of wearing detector earphones. This condition can be delayed to 1 or 2 hours by wearing earphones over the helmet so that 2 to 4 inches exist between ear and phone. This also permits the operator to hear a verbal alert for an ambush.

●Use of the Buddy System. This system is not only useful in training inexperienced Marines, but also provides an extra margin of safety to the individuals who employ it. Two Marines working together, in the same area, have the advantage of increased detection capability, mutual reassurance, and shared knowledge.

◊ Destruction Countermeasures

Once detected, mines and boobytraps must be marked and/or destroyed in place by the discovering person or unit to prevent accidential detonation by a following unit or individual Marine. Considerations for destruction are:

•Mines and boobytraps should not be moved unless absolutely necessary and then only by qualified EOD or engineer personnel. Many boobytraps are themselves boobytrapped, and if disturbed will detonate the associated device.

•Explosive devices should be destroyed by engineers. If engineers are not available, then devices may be destroyed by selected qualified personnel within each unit.

•Mines and boobytraps may be destroyed or neutralized by use of grappling hooks, demolitions, and artillery fires. The LVTE linecharge and the LVTE with plow-shaped mine excavator (figs. 5 and 6) should be considered for use in areas of high mine density.

◊ Avoidance Countermeasures

Strict application of training and careful planning of movements through danger areas will enable unit commanders and individuals to reduce casualties by simply avoiding the explosive devices. The unit leader must analyze from the enemy's viewpoint each area through which he intends to move his men. He must ask himself the question, "If I were the enemy, where would I put the boobytrap?" This question can and should influence both administrative and tactical movements and is a factor to be considered in the scheme of maneuver during an attack. Some suggested means for avoiding mines and boobytraps are:

Figure 5.--The LVTE firing its organic linecharge to clear mines.

Figure 6.--The LVTE with its plow-shaped mine excavator.

•Stay off trails, footpaths, cart tracks, or other likely routes of travel as much as possible. Vary routes used to villages and key terrain features. Use of the same route twice is an invitation to the enemy to employ boobytraps. Keep the VC/NVA guessing as to which route will be used next.

•Move where local inhabitants move. These people know the location of most

mines and boobytraps and will avoid these areas. In a village, stay near the villagers and watch which buildings they use. Use Vietnamese as guides whenever possible. Have sufficient money on hand to pay for information on mine and boobytrap locations and support VIP.

•Avoid patterns. Constantly change direction of movement. Check times of departure and return of patrols to ensure, for example, that all daylight patrols don't return before supper and all nighttime patrols depart after supper. Avoid the repeated use of the same bivouac areas.

•Maintain intervals of 15 meters between men and 100 meters between men and tracked vehicles. In view of the fact that the effective casualty radius of the M26 grenade is 15 meters, and that two or more casualties are suffered for each boobytrap grenade accidently detonated, the maintenance of proper interval is most important.

•Move slowly. Rapid movement generates carelessness. A unit must be allowed sufficient time to move to its objective.

•At times the enemy will show themselves only when they want to be seen. When pursuing the enemy, be especially alert for deliberately emplaced boobytraps on the axis of advance.

•Artillery and mortar fires near and in the area of operations will not only discourage boobytrap emplacement, but will also neutralize devices by sympathetic detonation, overturning and burying emplaced mines, and rupturing tripwires. Employment of these fires beside a road, before and during a road sweep, will discourage command detonation of road mines.

•At all times, a lightweight stick (bamboo) or a slender steel rod can be helpful if used to feel for tripwires.

•Mark detected mines and boobytraps so those following may avoid them.

•Helicopters can be used to extract a unit which finds itself in a heavily boobytrapped area.

•At times, the flanks of a road are boobytrapped out to 250 meters as an obstacle to road sweep security teams. Tanks, preceding the infantry, can detonate these boobytraps. When trafficability permits, tanks moving off and parallel to the road sweeps can also reduce tank road-mining incidents. Random selection of tank travel between road and adjacent terrain will keep the NVA guessing as to the actual route the tank will take.

•When on roads, stay in the well-used portion and off shoulders.

•Follow the tracks of the vehicle ahead. If there is no vehicle ahead, stay out of the ruts.

•Avoid holes, depressions, and objects lying on the road.

◗ Remember: A boobytrap too easily detected can be a ruse resulting in detonation of other explosive devices emplaced nearby.

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Immediate Action To Take When and After an Explosive Device Is Tripped

It is recognized that little reaction time exists once the detonation chain starts. The maximum delay for the M26 and foreign grenades ranges from 4 to 9 seconds If the delay element has been modified, the minimum fuse delay can be less than 1 1/2 seconds. However, since the time available cannot be predicted, certain immediate action can assist in reducing casualties and the degree of personal injury.

◗ Immediate Action

FIRST: Be alert for the "pop" of the exploding cap, the tug of the tripwire, or the warning of another Marine.

SECOND: Sound a warning so that others may take cover.

THIRD: Drop to the ground immediately.

Immediate action is designed as an instinctive reaction based on minimum fuse delay. When using it also remember:

•Do not attempt to outrun the explosion. The 800 fragments of the M26 grenade have an initial velocity of over 5000 feet per second. During the available delay, however brief, an individual can best remove himself from the cone of the explosion by dropping to the ground. He must assume a minimum delay in every case.

•If possible, when dropping to the ground, present the smallest target to the force of the explosion by pointing the feet in the direction of the charge.

•All those nearby should drop to the ground when the warning is sounded.

•Do not immediately rush to the aid of Marines wounded by mines or boobytraps. Frequently there is a second boobytrap in the vicinity of the first. The man nearest each casualty should carefully clear his way to the wounded individual and render first aid. Under no circumstances should the unit leaders or others crowd near the wounded men.

•Conduct a brief but careful search for other explosive devices in the immediate vicinity before moving on.

•If a device is tripped and does not explode, follow the same immediate action and then blow it in place.

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UNIT TRAINING

We have discussed preventive countermeasures, tactical countermeasures and individual countermeasures. Simply realizing that these countermeasures exist isn't sufficient. It is imperative that every Marine becomes knowledgeable of and proficient in the execution of the countermeasures discussed. This task can be accomplished through an aggressive and comprehensive unit and individual training program. Such training should emphasize:

•Wearing of helmets and body armor.
•Dispersion between men.
•Alertness.
•Visual detection techniques.
•Operation of electronic detection equipment.
•Demolition training which enables Marines to destroy explosive devices in place.
•Employment of the buddy system.

- Avoidance of patterns.
- Immediate action procedures and action to take subsequent to the detonation of an explosive device.

SECTION III

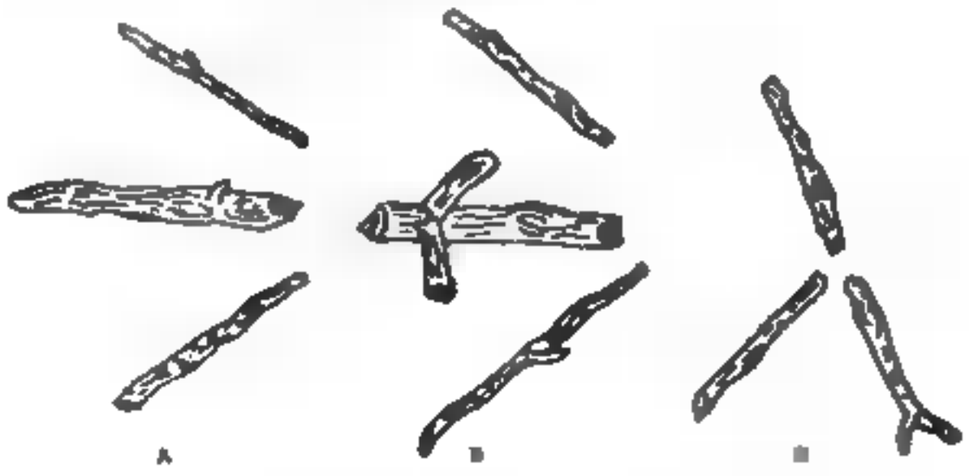
ENEMY MINE INDICATORS

If the enemy emplaces mines or boobytraps in the vicinity of villages or in areas where he moves or expects to move, he often indicates the location or direction of the explosive devices in some manner. The VC/NVA may not always follow the examples in this publication in absolute detail, but as a general rule, the indicators are usually found in a regular pattern such as sticks or stones in a line or sticks placed on or in the ground. This regularity of pattern is the danger signal (see fig. 7). Any arrangement of sticks and stones which appears unnatural indicates a strong possibility of the presence of

Figure 7.--Note the row of rocks on top of bridge beam at the foot of the bridge. This is typical of the warning signs used by the VC/NVA to warn of their mining activities.

mines and boobytraps. The illustrations which follow are examples of marking patterns indicating the presence of mines and boobytraps which have been encountered thus far in SVN.

ARROW MARKERS

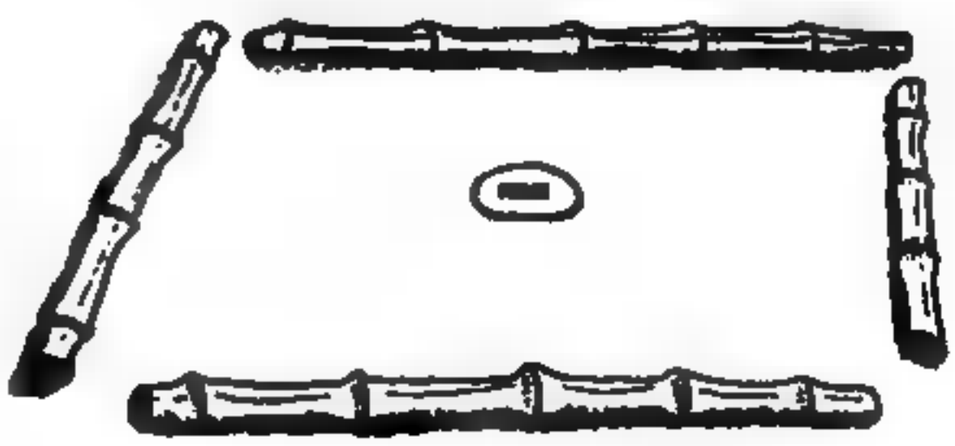


A. Three sticks are placed on the trail in the form of an arrowhead. The important thing to remember is that the point of the arrow does not always point in the direction of the boobytrap. The symbol can only be considered as a means to identify an area as being boobytrapped.

B. A variation of the three-stick arrowhead shows a fourth stick. Again, no definite pattern has been established as to direction or the reason for the fourth stick (usually broken). But it does mean boobytraps in the area.

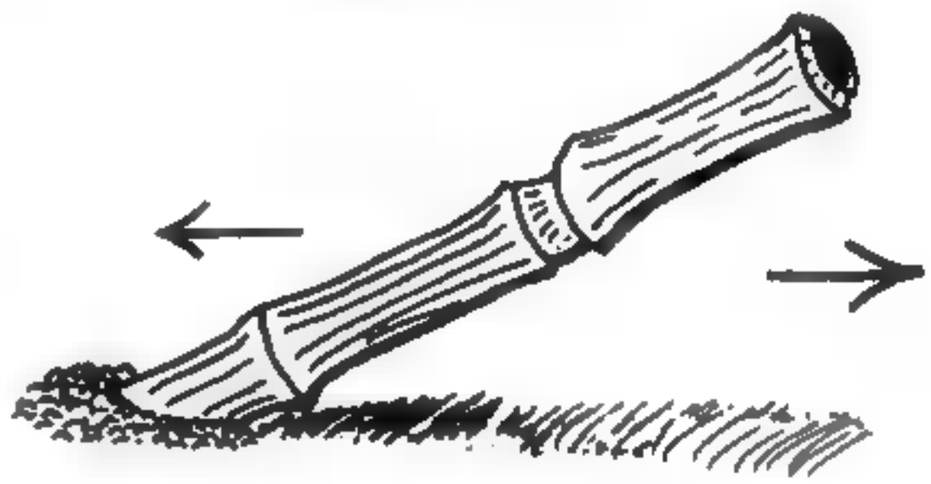
C. The "Y" arrangement is sometimes found farther down the trail from the arrowhead indicating the limit of the danger area. No pattern or specific distance has been established.

BAMBOO RECTANGLE MARKER



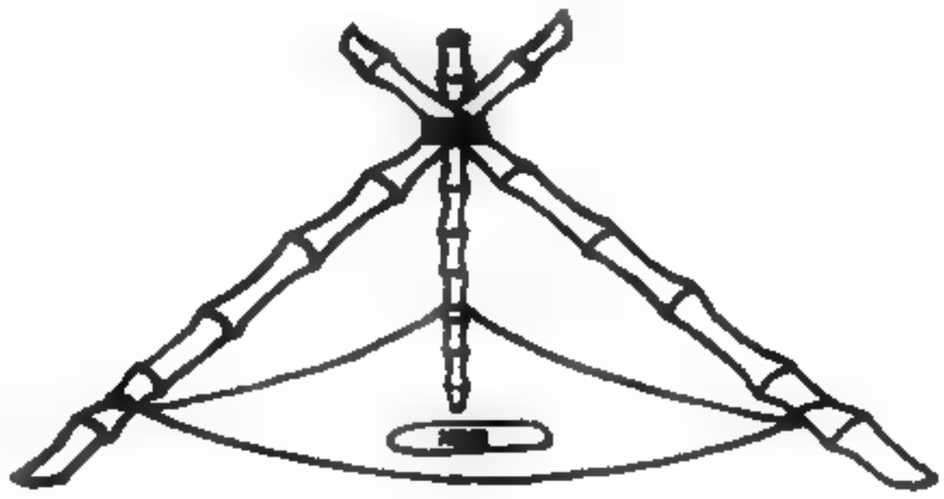
As shown, this marker usually indicates a boobytrap within the square. Most of these symbols found have been laid out with bamboo 18 to 42 inches in length.

BAMBOO MARKER



A piece of bamboo 6 to 8 inches long is stuck in the ground at an angle of 45 degrees. Generally, boobytraps can be expected along the axis of the bamboo in either direction.

BAMBOO TRIPOD MARKER



The bamboo tripod consists of bamboo, usually about 18 inches long, tied together to form a tripod. Wire, vines, cord or string is wrapped around the legs near the bottom to hold the tripod in place. This device has been found directly over punji pits, boobytraps, and mines.

BROKEN BUSH OR STICK MARKERS

A. The enemy has been known to break the tops of small saplings and bushes pointing the broken part in the direction of the boobytrapped area. Usually mines and boobytraps are planted 50 to 100 meters from this marker.
B. A stick or length of bamboo broken at a right angle and lying across the road or trail may mean an enemy mine or boobytrap 200 to 400 meters ahead.

BANANA LEAF MARKERS

A banana leaf or other similar leaf is folded down the center with a thin stick approximately the thickness of a toothpick woven through in two places. In addition to marking mines, this may indicate an ambush area. There is no pattern as to location or distance of mines or ambushes from this marker.

PARALLEL STICK MARKER

Short sticks or lengths of bamboo laid parallel to a road or trail usually mean the road or trail is free of mines or boobytraps.

GROWING GRASS MARKER

Growing grass is sometimes tied to form four growing sheaves of grass. The tied sheaves form a square of about 6 feet. The mine is buried or concealed in the center of the square.

TRAIL MARKERS

These devices have been used extensively together. The mine or boobytrap is placed (buried) under two large leaves. In front and to the rear, at no special distance, stakes are driven. The markers have also been used independently of each other at times.

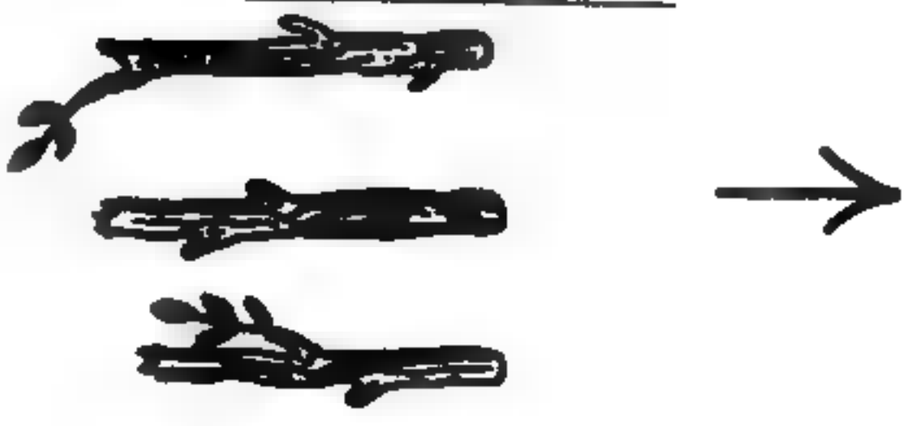
FORKED-STICK MARKER

A forked stick is driven vertically into the ground and another stick is laid into the fork with the elevated end pointing to the danger area. Distance to explosive device is unknown. This sign may also indicate enemy direction of movement.

ROCK MARKERS

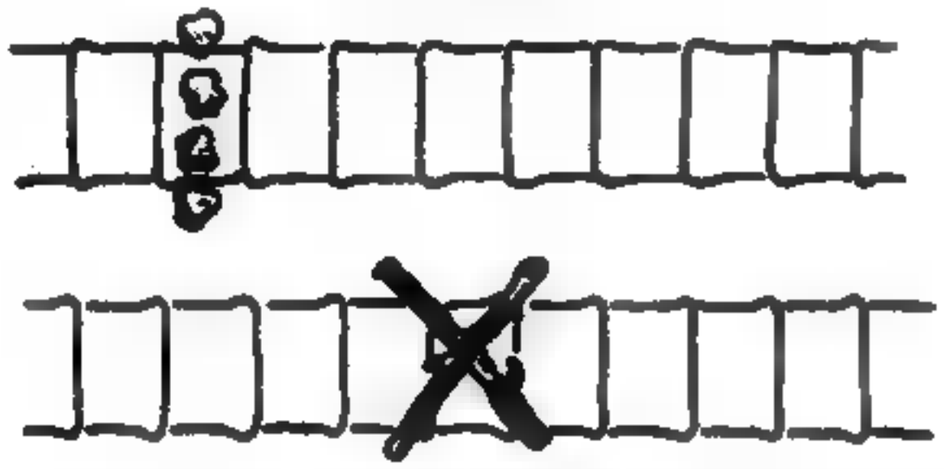
Various formations of rocks and small stones are used to mark boobytrapped areas. No pattern of distance or location has been established.

SPACED-STICK MARKER



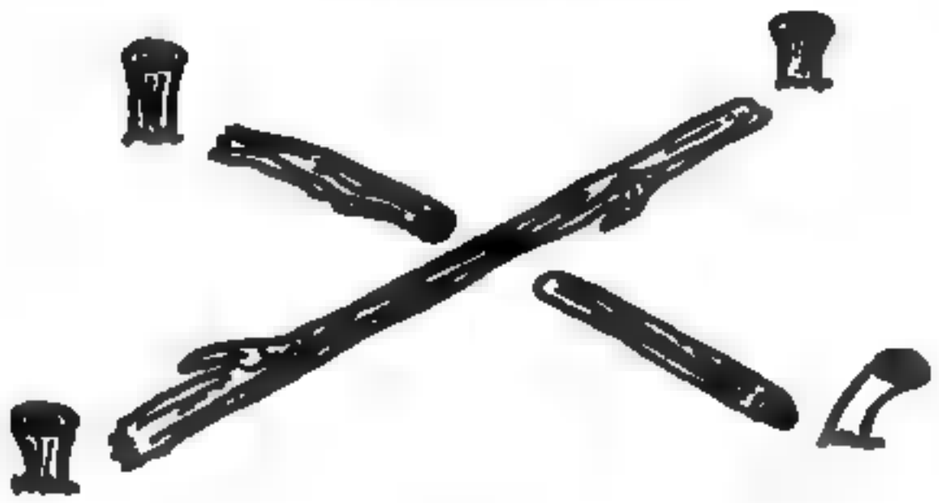
Three sticks, one on each side of a road or trail and one in the middle, usually mean the road is not to be used. A mine or boobytrap is usually 200 to 400 meters from the marker. Stones have been used in the same manner.

TRACK MARKER



The enemy has capitalized on our habit of following old vehicle tracks by placing mines in these tracks. Mines are sometimes marked with crossed sticks or an arrangement of stones. The location of the mine in relation to these markers is unknown. The mine may be under the marker or up to 400 meters farther on.

STAKES WITH X-MARKER



An M1A1 antitank mine with approximately 25 pounds of TNT was discovered under this marker. The mine had been marked with stakes at each corner and three sticks forming an "X" over the mine.

ENEMY MINES AND BOOBYTRAPS

EXPLOSIVE ANTIPERSONNEL DEVICES

Mines and explosive boobytraps employed by the enemy against friendly personnel are limited in type and quantity only by the availability of explosive materials and the imagination of the enemy. Anything that can be made to explode and cause injury can be rigged as an antipersonnel mine or boobytrap.

Antipersonnel mines and explosive boobytraps are very successfully employed by the VC/NVA. Part of this success is because Marines are not familiar with the physical description of explosive devices normally employed by the VC/NVA, and thus fail to recognize them prior to accidental detonation.

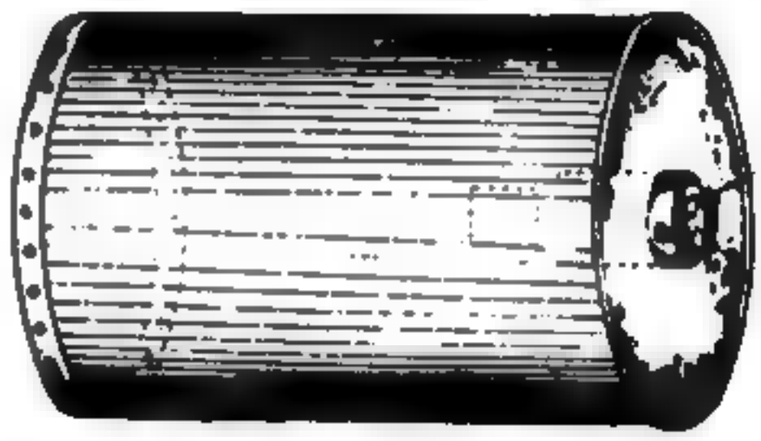
The following illustrations represent some of the devices employed by the VC/NVA in SVN.

MUDBALL MINE

The mudball mine consists of a handgrenade encased in sun-baked mud or clay. The safety pin (pull ring) is removed and mud is molded around the grenade. After the mud dries it holds the lever

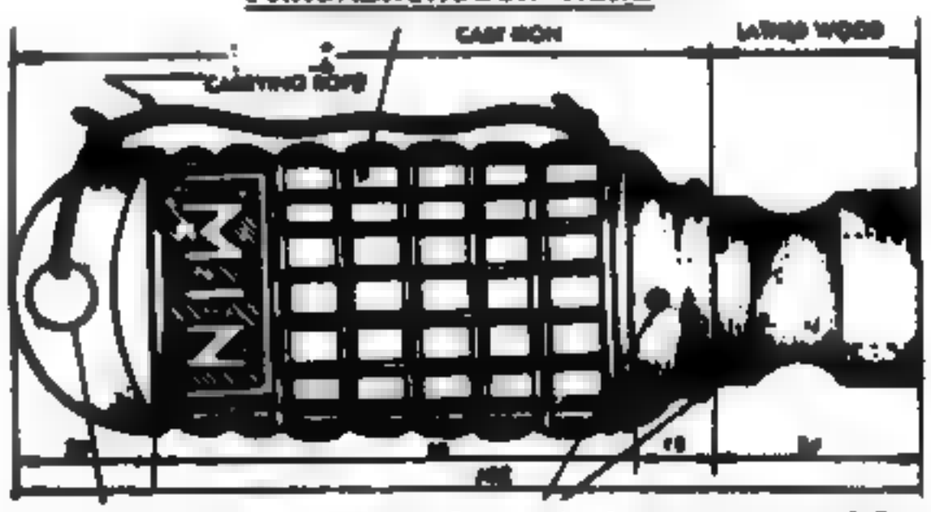
of the grenade in the safe position. The mudball is placed on trails or anywhere troops may walk. Stepping on the ball breaks the dried mud apart and releases the lever detonating the grenade. The U.S. M26 and M33 handgrenades have been the most commonly used grenades for this purpose although other lever-type grenades may be used.

TIN CAN ANTIPERSONNEL MINE



The tin can mine is constructed from sheet metal or any discarded metal container (C-ration, beer, or soft drink can). The firing device for the explosive is an improvised fuse with zero delay action. A handgrenade fuse may be used by removal of the delay element. The mine functions by a tripwire attached to the pull ring. Pressure on the tripwire pulls the pull ring, activating the mine in the same manner as a handgrenade.

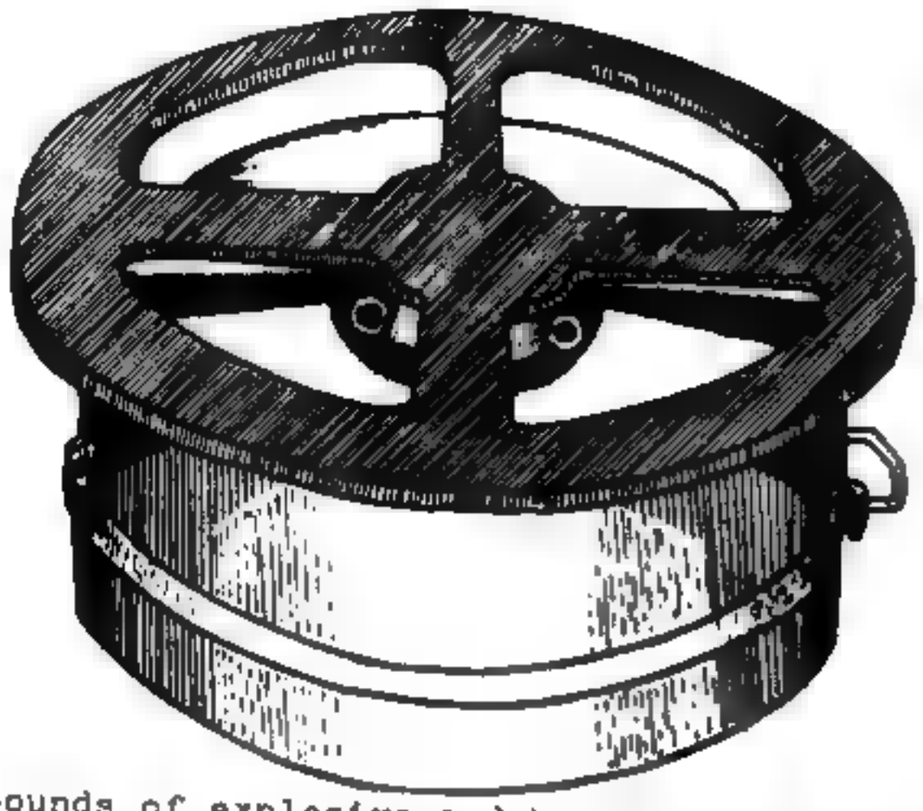
CAST-IRON ANTIPERSONNEL FRAGMENTATION MINE



This mine, made of cast iron, resembles a stick handgrenade with a very short handle. The word "MIN" is often found cast into the body. The handle houses a pull-friction igniter. A tug on a tripwire attached to the friction igniter will activate the fuse.

CHINESE COMMUNIST NO. 8 DUAL-PURPOSE MINE

Almost identical to the CHICOM No. 4 Dual-Purpose Mine, this device also has a double-acting fuse. Like the No.4, a pressure of 300 pounds on the pressure spider or a pull of 10 pounds on an attached tripwire will detonate the mine. Slightly larger than the No.4, this mine contains 5

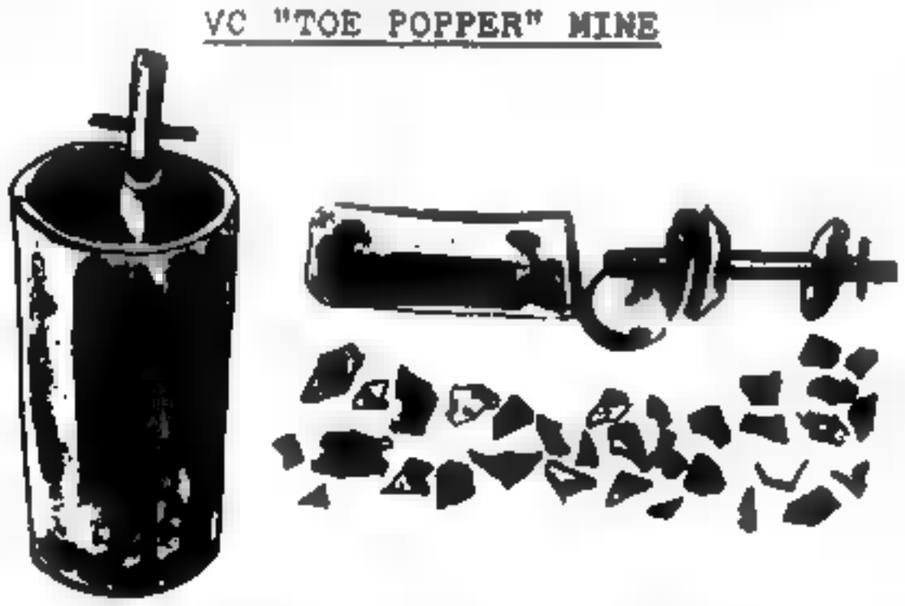


pounds of explosive and has an overall weight of 12 pounds. It is made of metal and coated with creosote for waterproofing.

BOUNDING FRAGMENTATION MINE

The bounding mine is improvised from expended U.S. M2 bounding mine or M48 trip-flare cases. A wooden cylinder slightly smaller in diameter than the mine case is hollowed out so that a standard grenade can fit inside. The wooden cylinder (with enclosed grenade) is then fitted into the mine case and the grenade's safety pin is extracted. When the mine is detonated, the cylinder and grenade are propelled upward. As the wooden cylinder and grenade separate, the handle flies off the grenade, activating the fuse.

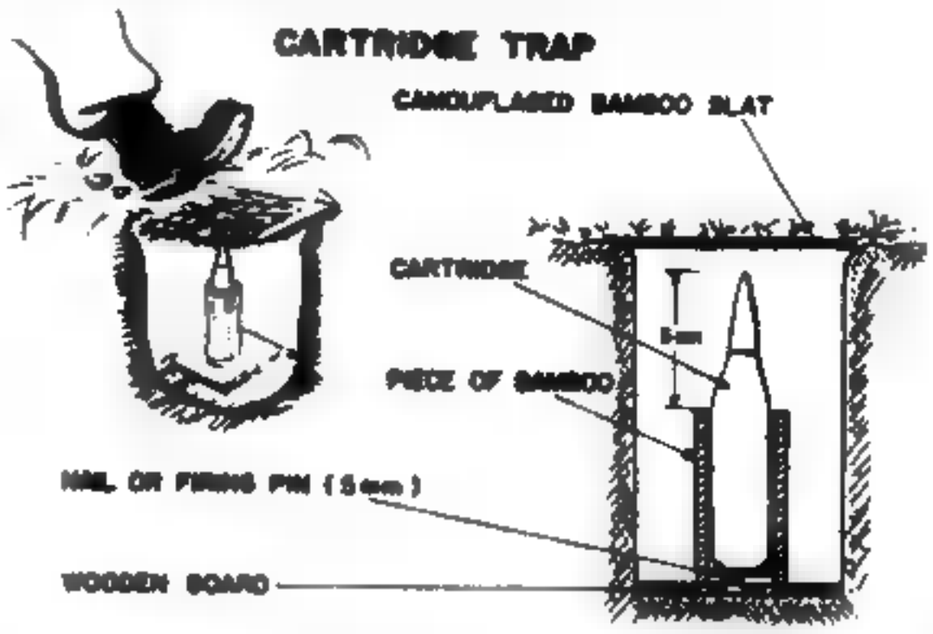
VC "TOE POPPER" MINE



This mine is fabricated of cartridge cases or pieces of pipe of various sizes. It is loaded with a charge of black powder, a primer, and a variety of fragments for missile effect. When the victim steps on the mine, the igniter detonates the black powder charge and propels the fragments upward.

CARTRIDGE TRAP

Four simple and easily obtainable components make up this mine; a bamboo tube, a nail, a piece of wood, and any small arms ammunition or M79 round. The piece of wood is used as a base. The bamboo tube is placed upright on the

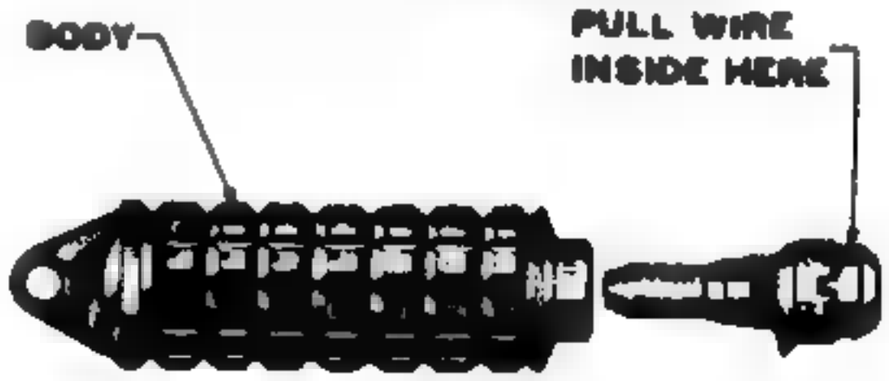


wooden base and a nail is driven up through the wood to penetrate the bottom of the bamboo. The cartridge is then wedged into the bamboo so that the primer is touching the point of the nail. Partially buried along a trail or path, the pressure of a man's foot stepping on the nose of the cartridge forces the primer onto the nail, firing the cartridge.

DIRECTIONAL FRAGMENTATION MINE (DH-10)

Commonly referred to as a "CHICOM or VC claymore," this mine has characteristics similar to the U.S. M18 Claymore Mine. Fused electrically, it is a command-detonating device designed for employment from ambush or defensive positions. It has a range of 150 to 200 meters and is effective against personnel and thin-skinned vehicles.

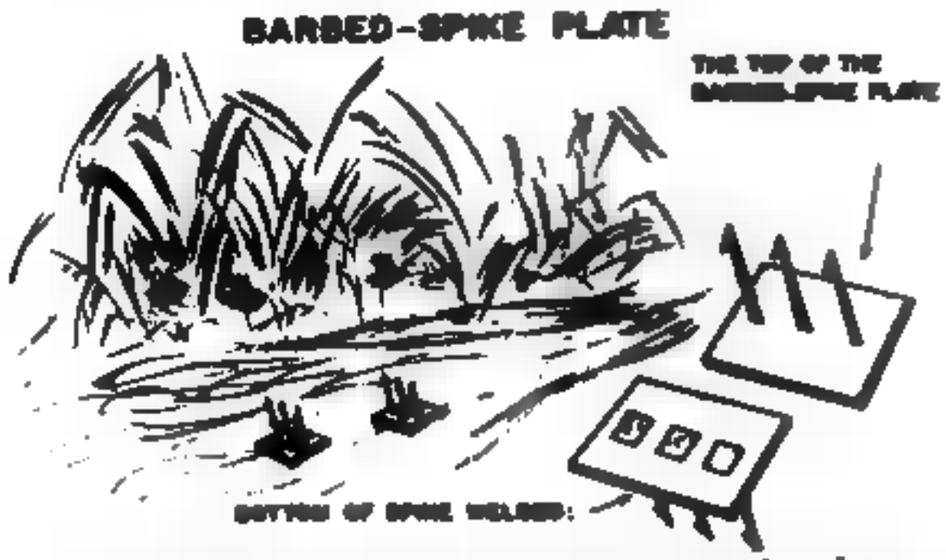
POMZ-2 ANTIPERSONNEL MINE



Chinese Communist copies of the Soviet POMZ-2 mine are now being employed by the VC/NVA. Weighing only 4.4 pounds, it is easily carried and can be emplaced quickly. Fused for detonation by tripwire (tension release or pressure release), it can also be rigged electrically for command detonation.

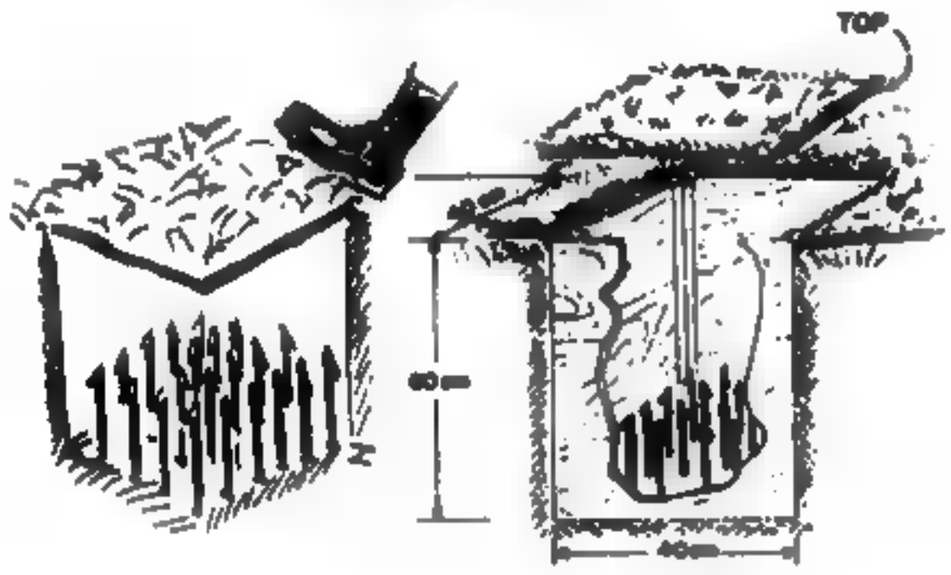
NONEXPLOSIVE BOOBYTRAPS

The idea of nonexplosive boobytraps is as old as man. From the simple earth pit lined with sharpened stakes to highly sophisticated mechanisms of triggered coils and latches, the enemy employs them all. The principle employed is simply to use anything that will catch the victim by surprise.



The barbed-spike plate is the basic element of all enemy nonexplosive booby-traps. The plate, a flat piece of wood or metal, is used as a base to fasten any number of barbed spikes. The spikes, ranging in length from several inches to several feet, are fastened securely to the base. When a man steps or falls on the spiked plate, or is struck by one, the spikes will penetrate, producing a serious wound.

SPIKE TRAP BOX



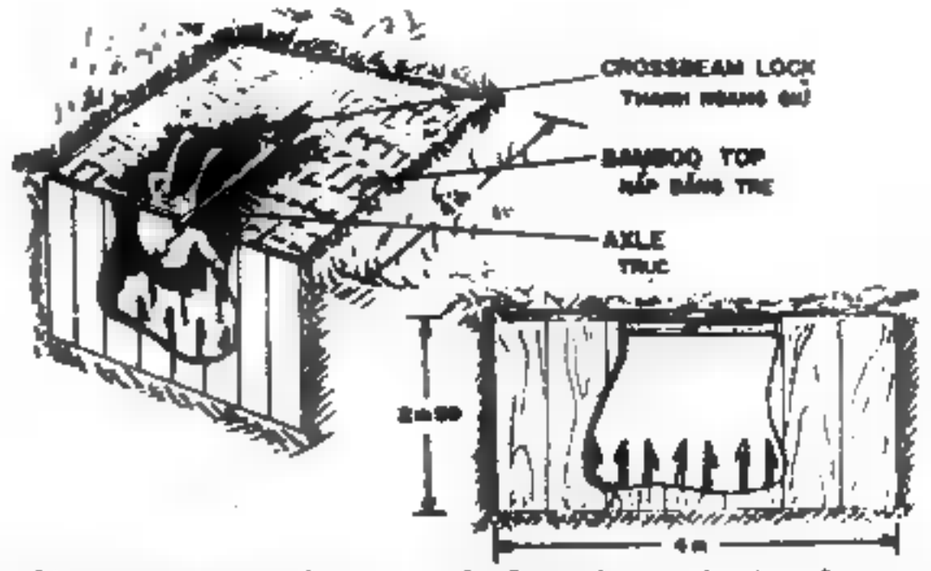
This device is a simple wooden box made of boards joined together with four corner posts. The box has a lightweight top but the bottom is removed. Barbed spikes are placed in the ground at the bottom pointing upward. This trap is usually set up on dirt roads and trails to take advantage of favorable camouflage.

POINTED BAMBOO STAKES

Made of bamboo which has been sharpened, the stakes are stuck in the ground and covered with grass. When a weapon is fired or a grenade thrown, troops seek cover and are impaled.

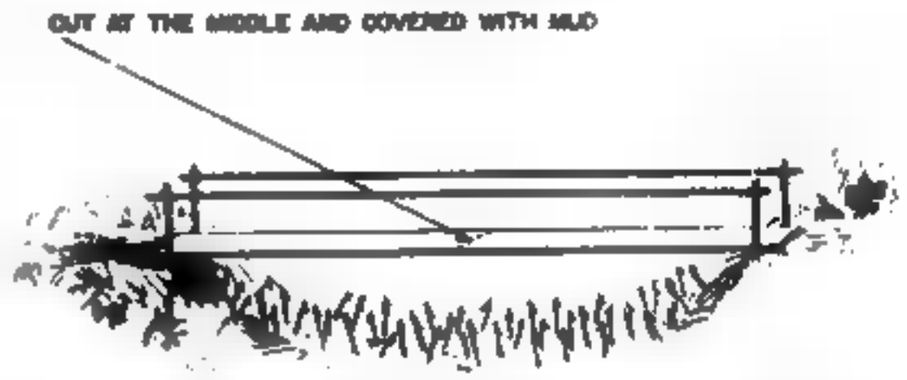
SPIKE TRAP PIT

A trap pit is a large trap box with a bamboo top. Stakes are made of sharpened bamboo or barbed spikes and used to line the box. When a man steps on the trap he will fall into the pit. The top turns on an axle; therefore, the trap does not need to be reset to work again. The pit is



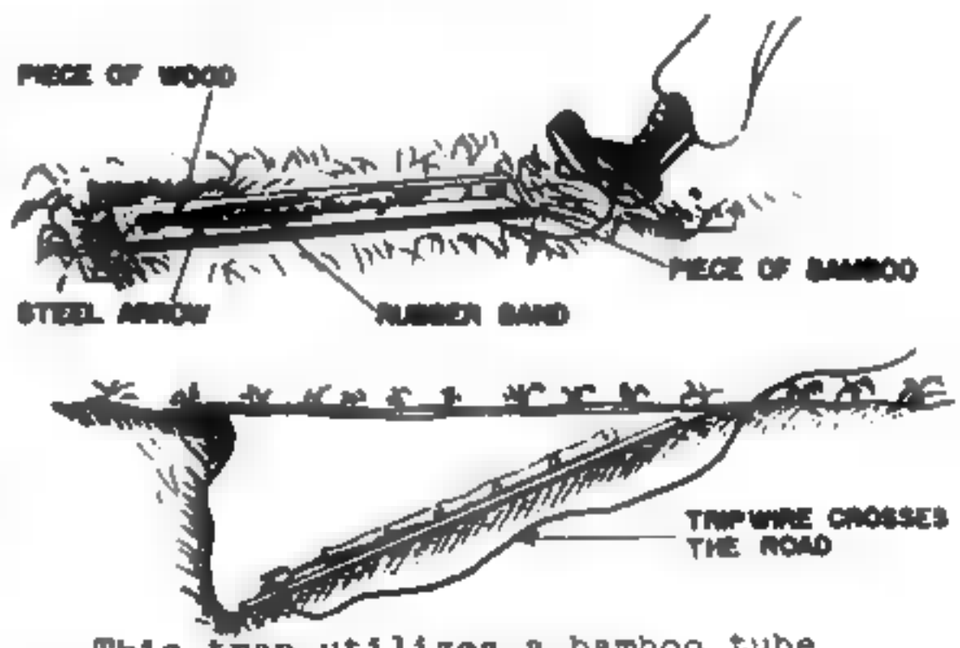
often prepared as a defensive obstacle and then made safe by locking it in place with a crossbeam (so it can be crossed safely by the enemy) until the desired time of use.

TRAP BRIDGE



A small footbridge is partially cut in the middle. The cut is then camouflaged with coverings of mud, etc. Barbed spikes or sharpened bamboo stakes are emplaced under the cut, using the water, mud or foilage under the bridge as camouflage. The weight of a man on the bridge will cause it to collapse, tumbling the victim onto the spikes. Like the spike trap pit, bridges can be prepared in this manner, then braced for normal use. At the approach of free world forces the braces are removed.

STEEL ARROW TRAP



This trap utilizes a bamboo tube (usually about 3 feet long) as a launcher. A steel arrow is placed in the tube. Using a block of wood as the bolt, a strip of strong rubber for power and a catch to lock the rubber strip, the device is fired with a tripwire. When the victim trips the wire, the latch disengages, allowing the rubber strip to launch the arrow.

BAMBOO WHIP

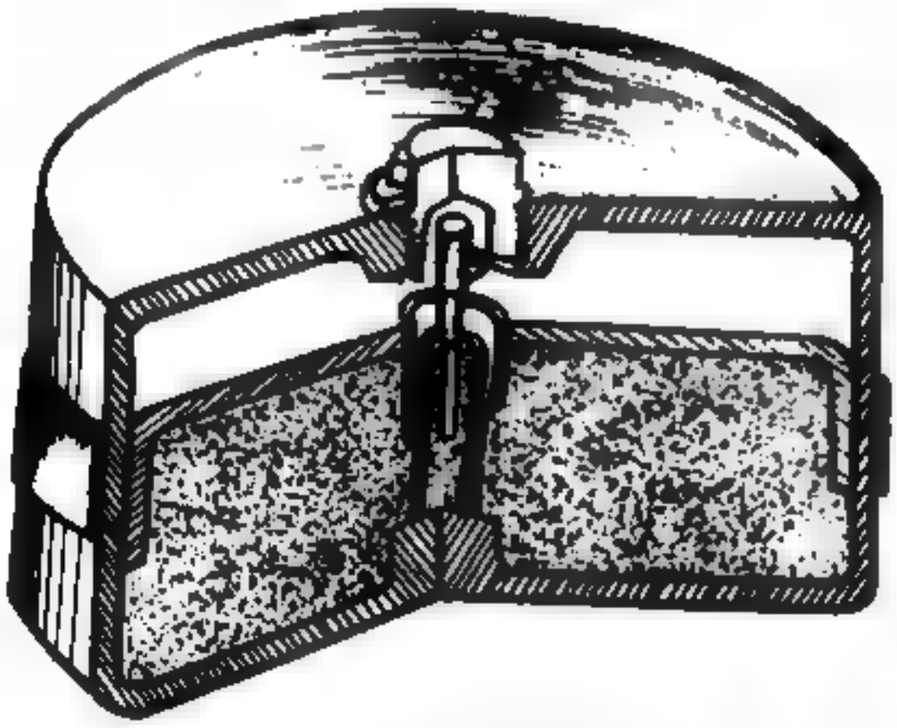
A strip of springy bamboo from 3 to 10 feet in length is used to make a bamboo whip. A barbed-spike plate is secured to the tip of the bamboo (or several of the spikes driven through the bamboo), and the

whip is drawn back and secured. A tripwire is then latched to the whip and the wire is strung across the trail. When a man trips the wire, the bamboo is released, and whips around, striking the victim with the spikes.

ANTITANK AND VEHICLE MINES

Mines employed by the enemy against wheeled and tracked vehicles vary from conventional antitank mines of foreign manufacture to rigged duds and locally produced explosive devices. All the industrially produced mines are of the type fused for detonation at from 150 to 400 pounds of pressure. They are buried slightly beneath the surface of the ground. The enemy generally employs these mines as designed but has varied fusing and positioning so that there is no definite pattern.

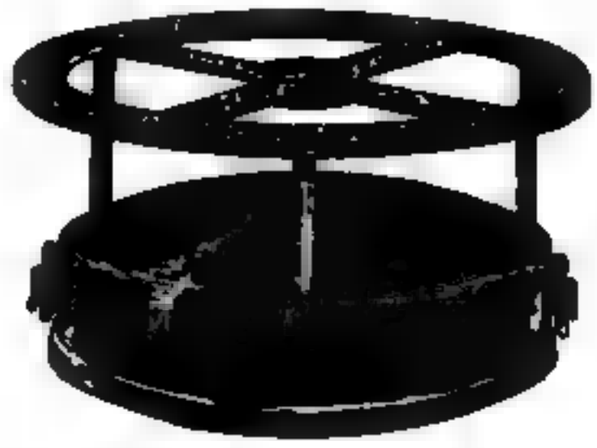
SOVIET ANTITANK MINE TMB-2



Designed to avoid detection by a mine detector, this mine is constructed of black or brown tar-impregnated cardboard. It is gauged for activation by a force of 350 pounds of pressure. Further, it can be waterproofed by use of wood and plastic sheeting, without losing its nondetection characteristic. It contains 11 pounds of explosive and has an overall weight of 15.4 pounds.

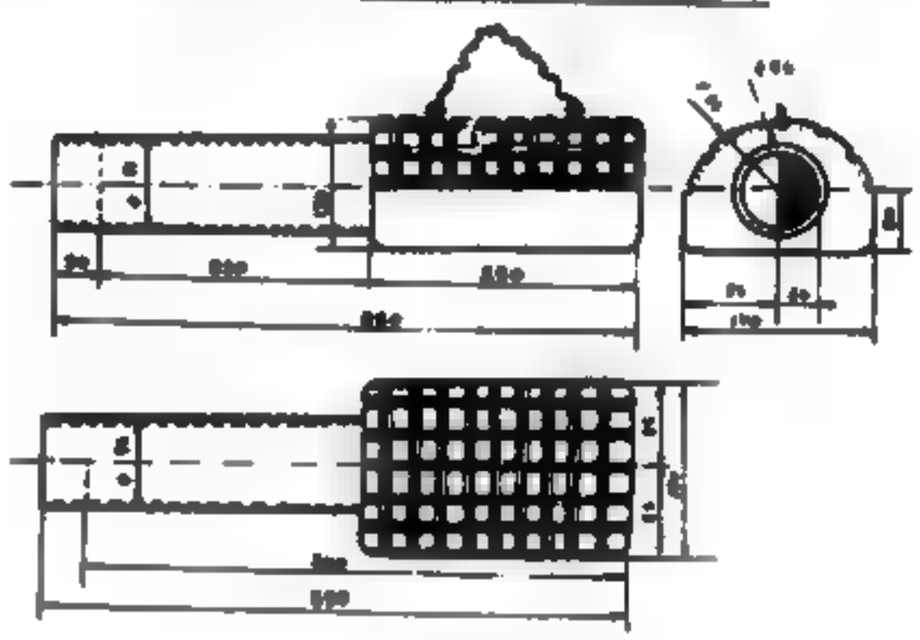
CHINESE COMMUNIST NO. 4 DUAL-PURPOSE MINE

Intended for employment against both vehicles and personnel, this mine incorporates a double-acting fuse that will detonate the mine under either of two circumstances: The first, when a load of



300 pounds of pressure is applied to the pressure spider; the second, when a pull of 10 pounds is exerted on a tripwire fastened to the fuse's striker-retainer pin. Constructed of creosoted metal, it carries 4 pounds of explosive and has an overall weight of about 10 pounds.

CONCRETE FRAGMENTATION MINE



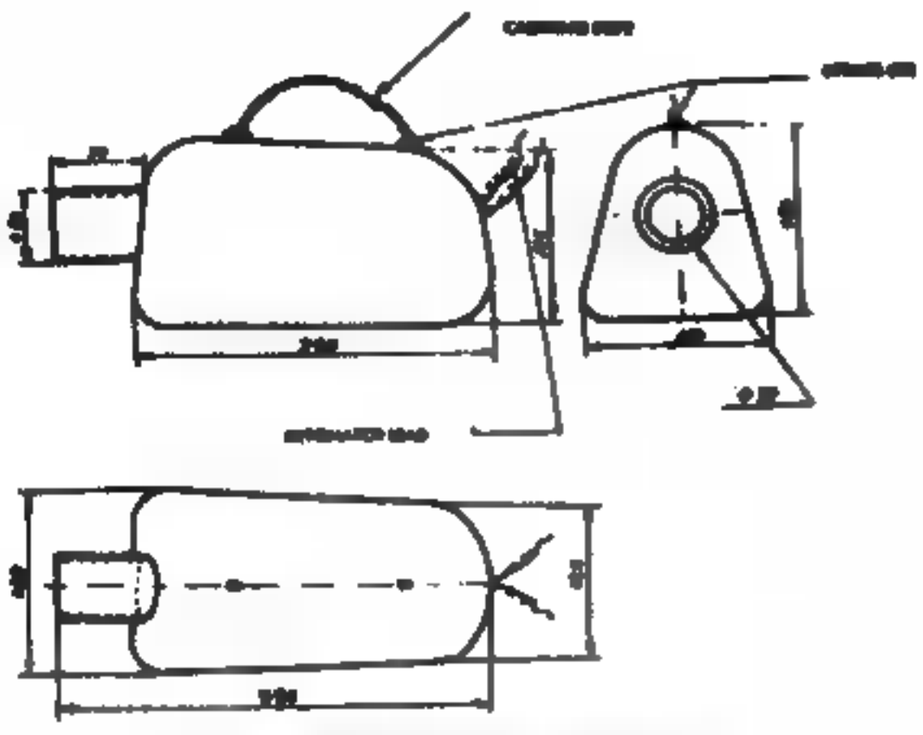
This mine is constructed of explosive encased in a cylindrically shaped concrete shell with a flat side for stable emplacement. A 2-inch-diameter pipe on one end of the mine serves as a carrying handle and detonator housing. The two swivels on top of the mine are used to tie it to an object. Usually employed as a command-detonating mine, it is equipped with an electrical firing device.

NVA CAST-IRON FRAGMENTATION ANTITANK MINE

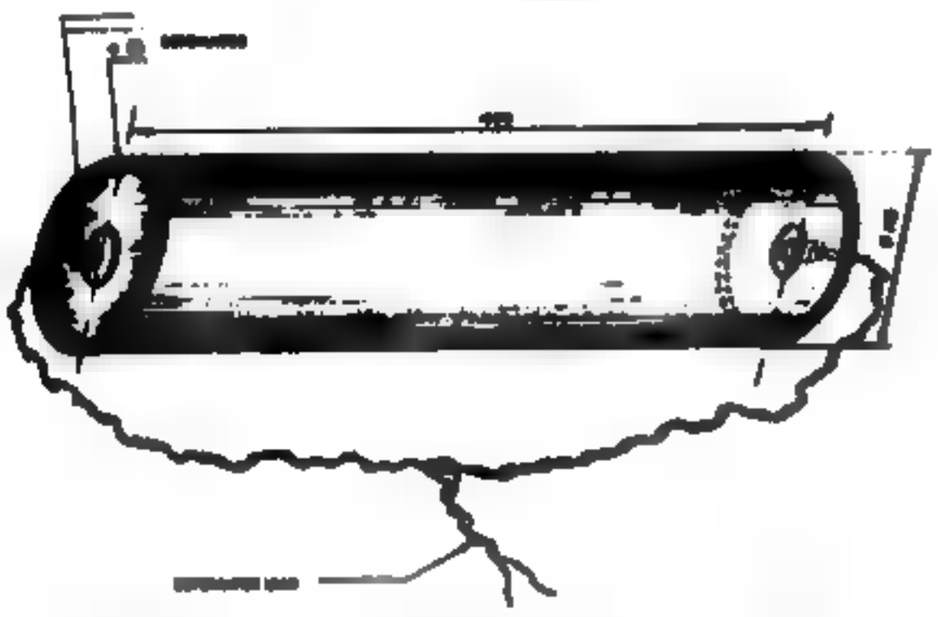
Produced in North Vietnam, this egg-shaped mine is made of cast iron with serrations on its outer surface. Designed for command detonation, the mine is fused with an electrical detonator and weighs 12 pounds.

VC MOUND-SHAPED MINE

Manufactured locally in VC mine factories, this mine contains an iron-pipe detonator encased in concrete. Another command-detonating mine, it is fused electrically and weighs 13 pounds.

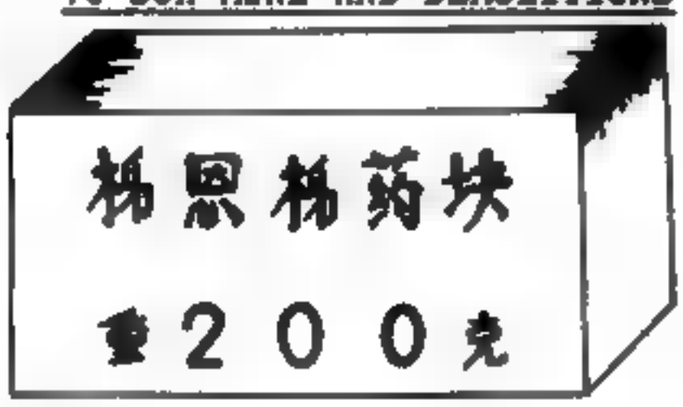


VC ROUND VOLUME MINE



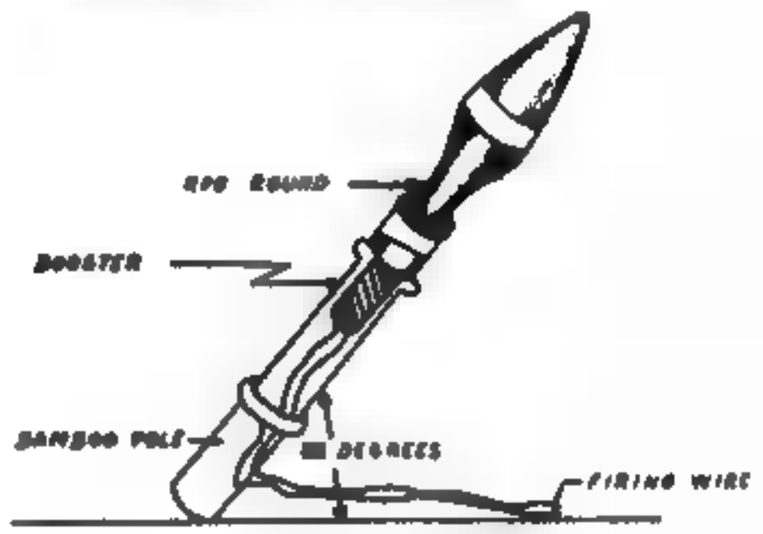
Produced locally in VC mine factories, this mine is a prototype of numerous other VC-manufactured explosive devices. Constructed of sheet metal, with welded seams, it generally weighs about 15 pounds, of which 13 pounds are explosive. Command detonated, it is fused electrically and employs two detonators, one in each end of the mine. The same principle of construction is applied to salvaged artillery shell casings, expended LAAW launchers, and most other devices using metal containers.

VC BOX MINE AND DEMOLITIONS



The VC box mine is constructed of wood utilizing discarded ammunition boxes or any scrap material. Mine detectors will not locate these devices. They can be water-proofed with plastic sheeting. Box mines are produced in various sizes but the most common contains about 40 pounds of explosive. The mine can be fused for command detonation or self-detonation by the use of various devices. The explosive charge is usually made up of standard Soviet or Chinese Communist 1-pound demolition blocks.

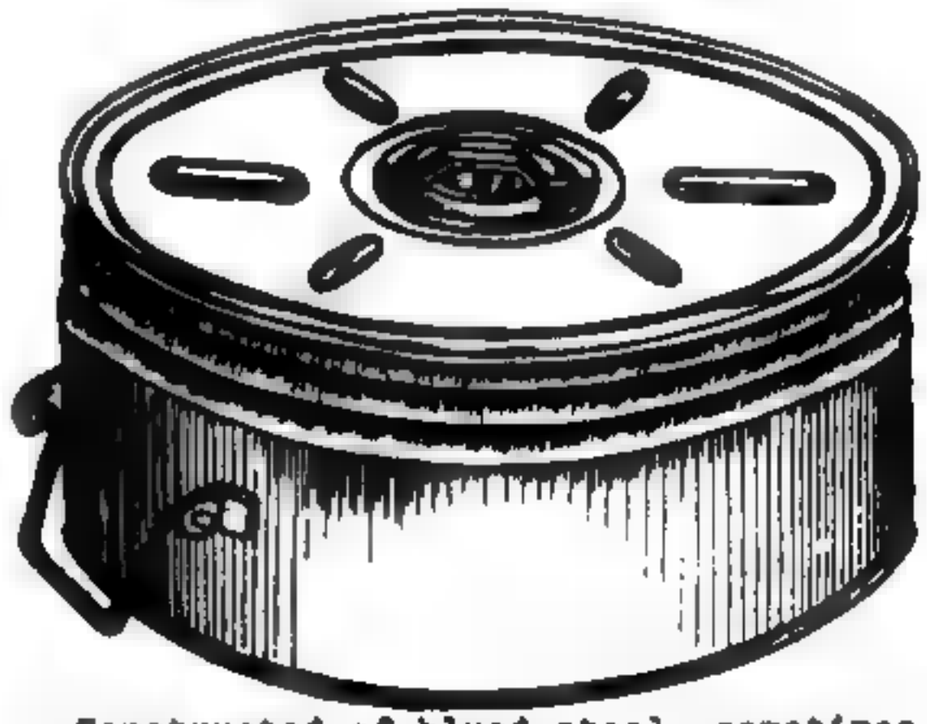
B-40 ANTITANK BOOBYTRAP



ANTITANK BOOBYTRAP

A length of bamboo is emplaced at an angle of 45 degrees along the shoulder of a road. A B-40 rocket is then placed in the bamboo tube and fired electrically by command detonation as the tank or vehicle crosses the line of fire.

SOVIET ANTITANK MINE TM-41



Constructed of blued steel, sometimes painted olive drab or white, the TM-41 carries an explosive charge of 8 pounds and has a total weight of 12 pounds. A force of 350 pounds of pressure on the lid will activate the firing device. With very little additional waterproofing it can remain operational indefinitely.

ANTIHELICOPTER MINING

The degree of success that the employment of helicopters has had on restricting and containing VC/NVA activities is evidenced by the enemy's efforts to destroy or neutralize these machines. In addition to intense ground fire, the enemy has devised numerous helicopter landing zone destruction systems. Such destruction systems range from the primitive planting of long pointed stakes to imaginative explosive devices. Because of its design, the helicopter is extremely vulnerable to these devices, particulary the rotors and airframe.

HELICOPTER EXPLOSIVE TRAPS

Grenades, artillery/mortar rounds, or

any other type of exploding ordnance are mounted in trees or on the surface of the landing zone. The explosive devices are rigged for tripwire detonation and the wire is strung to loosely emplaced poles. The rotorwash of landing helicopters will blow the poles from their loose position, tripping the device.

A 13-year-old Vietnamese boy recently claimed that the VC had forced him to reconnoiter helicopter landing zones. The boy was instructed by the VC to place handgrenades in the zones with strings wrapped around the levers, pieces of paper attached to the free ends of the strings and the rings (pull rings) pulled. Rotorwash from landing helicopters would then blow the paper, unwrap the string, and release the safety lever.

Gunpowder

Manufacture

Scientific American — May 11, 1861

The invention of gunpowder ■ claimed by the Germans for their countryman, Bertholdus Schwartz; but it is well known to have been in use among the Chinese since A.D. 85.

Some of the best qualities are composed as follows:

	NITER.	CHARCOAL.	SULPHUR.
Army powder.....	75	15	10
Sporting.....	78	12	10
Mining.....	65	15	20
French	78	12.88	9.12

The ingredients are first reduced to an impalpable powder in cylinder mills worked by water power, or between metallic rollers. It is next weighed, then properly mixed in a mixing trough with a wooden roller for three hours, and at some mills ■ ■ merely stirred about in a large tub for a short time; but when this is the case, more time ■ allowed for incorporating, which is the next process. The cylinders of most incorporating mills are two in number, and made of a very tough description of stone; they each weigh about three tuns. The bed of the mill on which they revolve is of the same material; but cylinders and beds of iron are also much used. The objection to iron beds is that they generally wear hollow in the middle, and it would be out of the question to have stone cylinders and iron beds. The charge which is placed in the mill at a time ■ 42 lbs., and it is moistened with ■ pints of water, which is placed in the mill with the charge; but this is varied according to the state of the atmosphere. At the end of three hours, the charge is withdrawn from the mill to be pressed either in a hydraulic or a powerful screw press; it is separated at equal distances by plates of copper so that a uniform pressure may be applied to the whole, which is about 600 tuns. When taken from the press it is in thin solid cakes or layers, called "press cake." This is broken in pieces of about a quarter of an ounce in weight, and removed to the corning house where it is granulated by placing ■ in sieves having a rotary shaking motion given to them by machinery, with two blocks of lignumvitæ wood which crush the powder between them and the sides of the sieve; two other sieves of different degrees of fineness are placed under the first, which catch the powder and separate it into fine and coarse grain (for artillery and muskets), and the dust, or meal powder, falls into a box placed beneath. The powder is now glazed by being placed in a cask, which revolves on an axle through the center about thirty times in a minute, which takes off all the corners of the grains and gives them a polish.

The last process ■ drying, which is performed by steam, radiation from hot irons, or solar heat; it is sometimes again sifted before barreling, to clean it and prevent it from caking together. The pressing and glazing processes, although they lessen the effective force of the powder, are absolutely necessary; first, to give the powder density, to prevent its breaking by carriage; second, to prevent its absorbing moisture from the atmosphere, which ■ is liable to do from the alkali which is in the charcoal; third, to prevent the powder losing its power when kept for any length of time. The quality of the powder produced depends more on the care taken in its manufacture than on the exact proportions of the ingredients.

COUNCIL TO OUR VOLUNTEERS

HOW TO PREPARE FOR THE CAMPAIGN

The Scientific American — May 11, 1861

(The following hints to our volunteers are timely and should be heeded. — Eds.)

TO OUR YOUNG SOLDIERS

1. Remember that in a campaign more men die from sickness than by the bullet.

2. Line your blanket with one thickness of brown drilling. This adds but four ounces in weight and doubles the warmth.

3. Buy a small india rubber blanket (only $1.50) to lay on the ground or to throw over your shoulders when on guard duty during a rain storm. Most of the eastern troops are provided with these. Straw to lie upon ■ not always to be had.

4. The best military hat in use is the light colored soft felt; the crown being sufficiently high to allow space for air over the brain. You can fasten it up as a continental in fair weather, or turn it down when it ■ wet or very sunny.

5. Let your beard grow, so as to protect the throat and lungs.

6. Keep your entire person clean; this prevents fevers and bowel complaints in warm climates. Wash your body each day if possible. Avoid strong coffee and oily meat. General Scott said that the too free use of these (together with neglect in keeping the skin clean) cost many a soldier his life in Mexico.

7. A sudden check of perspiration by chilly or night air often causes fever and death. When thus exposed do not forget your blanket.

"An Old Soldier."

Military Pyrotechnics of Former Days

Harper's Magazine — June 1869

SEVERAL French works* have been published in late years under the authority of the French Government on the origin and history of the employment of explosive and deflagrating missiles in war, which throw a great deal of light on the subject, and tend to correct many erroneous ideas which have long been prevalent in relation to it.

The predecessor of gunpowder in the history of war has always been considered to be a wonderful combustible known as *Greek Fire*, of which the most marvelous accounts have been circulating among mankind during the past two or three centuries. This Greek fire has been supposed to be a combustible possessed of most astonishing properties. It was capable of being thrown so as to envelop whole buildings, and even to overwhelm and destroy complete battalions on the field. Water would not extinguish it, but only made it burn the brighter. Nothing would put it out but drenching it with vinegar, or covering ■ with sand. Its composition, it was supposed, was lost in the fourteenth century, and had never been recovered. **The fact that the art was lost was inferred from the fact that no substance possessing the wonderful properties attributed to the Greek fire can be produced at the present day.**

It is somewhat difficult at the present day to obtain exact information in respect either to the composition of this substance, the construction of the engines or other apparatus employed in projecting it, or to the effects which it really produced. In respect to the machinery, and the form of the missiles, we must remember that there were no pictorial papers in those days, and no photography to preserve for future generations the exact realities of form and structure connected with the pursuits and usages of men. And in regard to the other points, relating to the properties of the substance, and the actual effects produced, far less reliance can be placed on the statements of even intelligent, cultivated, and careful men than might be supposed at the present day. For the line of demarcation between the natural and the supernatural—between what is and what is not scientifically possible—was then very vague and obscure, even in the highest minds. Ideas of the natural and supernatural were mingled and confused, or rather the supernatural was regarded as a legitimate realm of the natural, so that no tale could be so marvelous as to seem incredible, even to a grave and cautious historian. At the present day the recitals of excited or terrified witnesses, whose imaginations or whose fears lead them entirely to misconceive what they see, are at once corrected by that general knowledge of the relations of cause and effect which now prevails so extensively among all well-informed men that the bounds of the possible can not be very easily transgressed in narrations generally received. But it was not so

Ricin: Its Manufacture and Use

By Kurt Saxon

The beauty of ricin as a poison is that it doesn't act until three or four days after ingestion. In this way, the victim doesn't know he's doomed until days later. In most cases he'd be hard put to remember anything that might have caused his illness. He dies of what seems to be pneumonia.

The dosage can be as little as one 2000th of a grain. A grain is about the size and weight of a grain of rice or wheat. That's how the grain measurement got its name. If you could split a grain into 2000 parts, one of those parts of pure ricin would be fatal to the average man.

It is best administrated under the skin or in the lungs, by breathing in. Even so, taken by mouth it is still highly effective, even in very tiny amounts.

The two articles on ricin at the end of this article tell of survival by accidental ingestion by adults of castor bean dust or of children who live after swallowing a few beans. But when relatively pure ricin is administered on purpose; when the victim breathes it in, gets it under the skin, or swallows it, he is doomed. There is no known antidote.

The treatments indicated are to help the accidential victim fight off the effects of castor beans or their dust. It doesn't work with refined ricin. Nothing does.

The ricin you'll be making may not be completely pure but whereas one thoroughly chewed bean can kill a man, the ricin extracted fro mthat bean should kill several.

To make my ricin I used one ounce, or 60 beans, and got less than 1/16th of an ounce of the albuminous toxin. Even so, used sparingly, that is a lot of ricin.

The books say that ricin is an albumin. Egg white is also an albumin. I reasoned I should take out the 55% of oil from the castor beans as the books say it isn't in the oil. After the oil is removed the albumin containing pulp remains. The next step was to extract the albumin from the pulp and the whole process is childishly simple.

Castor beans are grown as decorative outside plants. They also yield up to 55% oil so can be gotten in bulk from some seed companies. If you live in southern California or other mild climate you can often find them growing wild. The seeds are prominent and can be easily collected in the fall. But unless you are around at the right time it's best just to buy them.

So far, the process is relatively safe. But for handling the powdered, oil-freed pulp, buy a dust mask and pair of rubber gloves from your hardware store or pharmacy. Surgical gloves and mask cost less than $1.00 at the pharmacy.

CASTOR BEAN, JEQUIRITY BEAN

Handbook of Poisons

R.H. Dreisbach — 1955

The castor bean plant (Ricinus communis) is grown for commercial and ornamental purposes. The residue or pomace after castor oil extraction of castor beans gives rise to dust which may cause sensitivity reactions or poisoning.

Jequirity (rosary bean, Abrus precatorius) ■ grown as an ornamental vine in tropical climates. The beans are ■ mm. (1/4 inch) long, bright orange with one black end. They are used as rosary beads and as decorations for costumes.

Ingestion of only one castor or jequirity bean has caused fatal poisoning when the beans were thoroughly chewed. If the beans are swallowed whole, poisoning is unlikely because the hard seed coat prevents rapid absorption.

in those early times.

In respect to the apparatus by means of which the compound of combustibles known as Greek fire was projected into the enemy's works, some representations have come down to us, though only from comparatively modern times. The use of such means of attacking the vessels or fortresses of the enemy seems to have been resorted to in very early times, since allusions to them occur not unfrequently in the works of writers who lived and wrote several centuries before Christ. Indeed, one of the recipes for making such compositions, as they were employed in those early days, is still extant, as follows:

"To make an unquenchable fire take pitch, sulphur, tow, manna, resin, and the scrapings or saw-dust of resinous wood, such as torches are made from. Mix these substances well, then light the mass and throw it against whatever you wish to set on fire."

It is obvious that such a mixture as this would form an exceedingly combustible compound; but it could not possess any of those marvelous qualities which were attributed to the Greek fire. It could not burn under water, though some substances, as will presently be explained, have this property.

The use of combustibles of this character seems to have been first resorted to in the countries lying about the eastern shores of the Mediterranean—unless indeed the Chinese, and some of the other Oriental nations, anticipated the Europeans in this, as they have done in respect to many other important discoveries. The reason why the use of such a mode of warfare appeared first in these Oriental countries is supposed to be because in that region are found natural deposits of certain combustible fluids, such as naphtha, and other vegetable oils, which were admirably adapted to this use. At any rate the employment of such subetances appears first conspicuously in history in the time of the Greek empire. A great many recipes are extant describing the different kinds of composition employed. They all, however, consist of a mixture of simple combustibles, depending for flagration on access to the air.

These subetances were placed in barrels, balls, or other receptacles, and thrown by means of various mechanical contrivances known in those days into the works of the enemy.

The *Slinging Engine*, represented at the head of this paper, was constructed to throw a barrel of the combustible compound by means of a gigantic sling, seen in the engraving as thrown open from the end of the beam, after the projection of the barrel. The beam was drawn back by means of the rope wound round the capstan, shown behind and below it. Its elasticity, after being thus brought into a state of great tension, was then suddenly released, when the end of the beam, carrying the barrel of combustibles, previously set on fire, was thrown violently forward and the barrel hurled from the sling, all in flames, into the works of the enemy.

A battering engine, the design and operation of which is obvious, stands by the side of the sling.

The subjoined engraving, copied from an illumination in a Latin manuscript of the thirteenth century, gives a representation of the mode of employing the Greek fire in naval warfare. The craft here represented seems to be in some sense the prototype of the modern bomb-proof, ram, and fire-ship, all in one. But although this drawing is taken from an ancient work, no absolute reliance can be placed on the details of the construction as represented in it, inasmuch as such drawings were made in

Ricin, a toxic albumin found in castor beans, and abrin, a similar albumin found in jequirity beans, cause agglutination and hemolysis of red cells at extreme dilutions (1:1,000,000). They are also injurious to all other cells.

The pathologic findings in fatal cases of castor bean or jequirity bean poisoning include hemorrhages and edema of the gastrointestinal tract, hemolysis, and degenerative changes in the kidneys.

Clinical Findings:

The principal manifestations of poisoning with these beans are vomiting, diarrhea, and circulatory collapse.

A. Acute Poisoning: (From ingestion.) After a delay of one to three days, nausea, vomiting, diarrhea, abdominal pain, drowsiness, disorientation, cyanosis, stupor, circulatory collapse, and oliguria may begin and progress to death in uremia up to 12 days after poisoning.

B. Chronic Poisoning: (From inhalation of dust from castor bean pomace.) Dermatitis and inflammation of the nose, throat, and eyes. Instances of asthma have also been reported from exposure to the dust.

C. Laboratory Findings:

1. The urine may show albumin, casts, red blood cells, and hemoglobin.
2. The blood may show increase in urea and N.P.N.

Treatment:

A. Acute Poisoning:

1. Emergency measures —

a. Remove ingested beans by gastric lavage or emesis followed by catharsis

b. Maintain circulation by blood transfusions

2. Antidote — None known.

3. General measures — Alkalinize urine by giving 5 to 15 Gm. (75 gr. to 1/2 oz.) of sodium bicarbonate daily to prevent precipitation of hemoglobin or hemoglobin products in the kidneys.

4. Special problems — Treat anuria

B. Chronic Poisoning: Remove from exposure.

Prophylaxis:

Children should not be allowed access to castor beans or jequirity beans.

Dust from handling castor bean pomace should be controlled by proper air exhaust.

Prognosis:

The fatality rate is approximately 5 percent. Death may occur up to 14 days after poisoning.

RICIN

A MANUAL OF PHARMACOLOGY
TORALD SOLLMANN, M.D. — 1924

Occurrence, Clinical Symptoms and Treatment — This toxin is contained in the castor seeds, but does not pass into the oil. Similar phyto-toxins occur in croton seeds (Crotin); and in jequirity seeds (Abrin); in the bark of the locust tree, Robinia pseudacacia (Robin); and in the seeds of some leguminous plants (Phasin). The last is but weakly toxic (Review of Literature, Ford, 1913). The ricin is responsible for the toxic effects on eating the castor seeds; five or six of these are fatal to a child, twenty to adults; three or four seeds may cause violent gastroenteritis, with nausea, headache, persistent vomiting, colic, sometimes bloody diarrhea, thirst, emaciation, and great debility. The symptoms usually do not set in until after several days. More severe intoxications cause small frequent pulse, cold sweat, icterus, and convulsions. Death occurs in six to eight days, from the convulsions or from exhaustion. The fatality is about 6 per cent. This small fatality is due to the destruction of the poison in the alimentary canal. The treatment would be evacuant and symptomatic. Three to ten days are required to complete recovery (Critical Review and Bibliography,

those days for purposes of embellishment, and not for instruction, and so only a general resemblance to the natural object, sufficient to suggest its character and use to the mind of the reader, was all that was usually aimed at. It was, in other words, the *ideal* and not the *actual* presentation which the artist had in mind.

All that can be certainly inferred, then, from such an illustration is, that a species of vessel was made use of in those times covered with a roof sufficient to protect the navigators from spears and arrows, and provided with a pointed prow to act as a ram, and projecting beams bearing barrels charged with materials for producing the Greek fire.

Another form of vessel is given in an ancient manuscript, differing materially from the last. In this the barrel containing the fire is suspended from a species of *crane*, by means of which it could be swung over the decks of an enemy's ship when in close quarters. In this, as well as in the other case, all that we can infer from the drawing is the general nature and design of the contrivance, and of the principle on which it operated. The true proportions of the parts and the details of the construction were purposely disregarded in illustrations of this kind.

Observe in the engraving the extra barrel of combustibles ready upon the deck, and the circular watch-box on the top of the mast, where a look-out-man could be stationed, under protection from the spears and arrows of the enemy, and yet at the same time in a position to observe every thing through the slits in the box, and so to direct the helmsman in guiding the vessel. Weapons of the character of boarding-pikes are placed, ready for use, at the stern.

The damaging and destructive effects of the Greek fire were not confined to its power of setting the enemy's works on fire. It contained substances which emitted fumes of a horribly offensive, poisonous, and destructive character. It was necessary on this account that the wind should be in the right quarter, that is, blowing from the assailants toward the enemy, whenever it was employed. Sometimes the receptacle containing the composition was placed upon the end of a long spar attached to a car, which was to be propelled by hand. The soldiers would pile up a great quantity of wood before the gate of the castle or strong-hold attacked. This car would then be driven by soldiers stationed behind it, where they were protected by an inclined shield from the assaults of the enemy. The shield is perforated with openings, to enable those within and behind it to see where to apply the fire; and ■ contains a place of shelter within, forming a receptacle which would be useful in various ways—among others, for the protection and succor of wounded men, and for taking them back to a place of safety.

By this arrangement the wood heaped up before the door of the fortress might easily be set on fire, and if the wind was in the right quarter, and if the wood had been previously prepared by being covered with pitch, naphtha, and resins, the consequence would be an immediate bursting forth of volumes of fierce flame and suffocating smoke, which would drive over the wall, penetrate the works, and make it impossible for the men to draw near for the purpose of doing any thing to arrest the mischief.

The ancient manuscripts referred to above contain illustrations of the use of the Greek

Continued on page 34

Ford, 1913).

Effects on Animals — The actions can be best studied on rabbits, by hypodermic or intravenous injections. Even with the latter, there ■ an incubation period of at least twelve to eighteen hours before symptoms appear. These correspond to those described for man. They are partly local — gastroenteritis; and partly central — paralysis of the respiratory and vasomotor centers. The local inflammation also occurs on other mucous membranes to which the poison may be applied, especially the conjunctiva.

The autopsy findings are very characteristic. They consist in swelling and reddening of Peyer's Patches and mesenteric lymph glands, internal hemorrhages and diffuse nephritis. Cruz, Flexner, Mueller and others have shown that these lesions are not due to thrombosis, but to direct action on the tissues. The site of the injection is boggy.

Frogs have a much higher resistance than mammals. The phytotoxins have no direct effect on muscle or nerve.

Action on Blood — in vitro, ricin hemolyzes and agglutinates the corpuscles of nearly all warm-blooded animals (Stillmark, 1886). The agglutination does not seem to occur in the body, but is of great importance as an immunity phenomenon. Leucocytes, epithelial and other cells (except those with thick membranes, as yeast) are also agglutinated; as likewise the stroma of laked corpuscles (Elfstrand). The presence of serum hinders the effect.

The agglutination has been referred to precipitation of the nucleoalbumins (Stassano) or other proteins, such as those of serum (Kraus, 1902). All kinds of colloid precipitates carry down ricin, and it is absorbed by solid proteins and lipoids.

Nature of Ricin — This appears to be a true protein; for a preparation of ricin has been obtained, which is a typical albumin, and which is so active that 0.0005 mg. is fatal to a kilogram of rabbit; i.e., 1 part of the ricin is fatal to 2,000,000 parts of rabbit; the fatal dose for man would therefore be about 0.035 mg., or 1/2,000 grain (Osborne, Mendel and Harris, 1905; Osborne, 1909). The agglutinating action is also very powerful.

The attempt has been made to separate the agglutinin (which is adsorbed by blood corpuscles) from the cytotoxin, which is destroyed by peptic digestion. Jacoby, 1902, believes that they have certain groups in common.

Antiricin — Injections of the phytotoxins produce typical antitoxins, so that an immunized animal can survive 5,000 ordinary fatal doses of ricin. Some of the basic work of Ehrlich was done with ricin and abrin. He showed (1891) that the immunity starts in five to six days, and lasts six or seven months. The resistance of the corpuscles ■ unchanged, the antiricin being contained in the pseudoglobulin fraction of the serum (Jacoby, 1902). It contains antitoxin, antiagglutinin (probably identical) and precipitin. Madsac and Walbum found that this combination obeys the same laws as diphtheria antitoxin. The toxicity of ricin is modified rather complexly by lecithin (Lawrow, 1913).

Here is the new process for highly potent castor bean powder. Since one well-chewed castor bean can be fatal, the same bean with the oil removed would take up only half the volume.

Since it's relatively tasteless, the powder can be sprinkled in ■ sandwich, on a salad, in a bowl of soup, or whatever. For lower varmints, use the powder liberally on baits. In a few days you'll be shed of whatever vermin troubles you.

This doesn't mean ricin bullets or darts should be discounted. Under the skin, the stuff is much more potent. A hollow-point .22 bullet, spread out slightly and packed with finely powdered castor bean would surely be fatal. But use a drop of mucilage instead of water in the powder and let dry a few days and seal with Elmer's Glue.

With the darts, just mix half a bean's volume of powder with enough mucilage to make a moldable mass and mold it on the dart just below the sharp point and let it dry. ■ you've already made the original ricin darts, I'd go with them.

Back to the new process for making castor bean powder. Really fine and fluffy powder can also be used in even a diabetic hypodermic needle. Mix the powder from one bean in one cc of water, suck it up and it's ready to go. That doesn't mean you process the beans individually. Just measure the equivalent. This is especially good for euthanasia, like in a IV tube or anywhere on a comatose body.

To get the best powder you'll want ■ remove the hulls. Put two ounces of water in a glass and pour in a teaspoonful of lye (sodium hydroxide) from any grocery store. Wait until it cools and put in one or two ounces of beans. They float so put a weight on them to hold them under. Soak one hour.

Then wash them thoroughly and dry them in a towel. The hulls expand and can easily be cracked along the sides with a fingernail. A few minutes practice will have you shucking right along and it will give you something to do while watching TV and meditating on your sins.

Put the hulled beans in a glass or metal blender with four ounces of acetone to each ounce of beans. Blend them until they are the consistency of milk and put them in a glass jar with a lid for three days.

Then swirl well and pour the brew into a coffee filter in a glass, opaque plastic or metal funnel. When the dripping stops, take out the filter and gently squeeze out the remainder of the acetone. Spread the filter on a newspaper and let it dry.

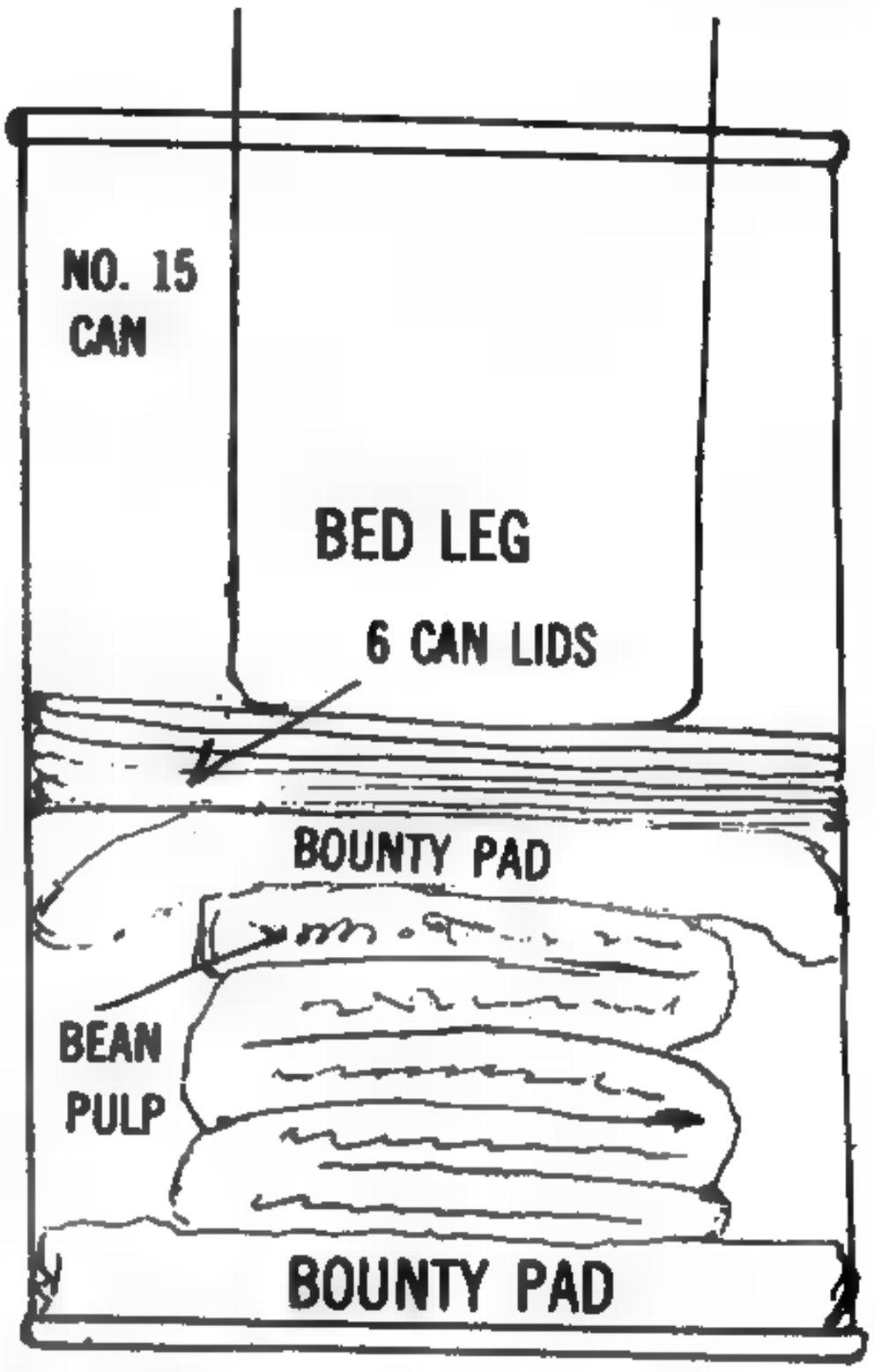
Although most of the oil is out of the pulverized beans, some of it may be picked up again as the acetone-oil mixture goes through the pulp while it's in the filter. If, after the acetone has evaporated from the powder, it still holds together after being compressed, it still has too much oil in it. Put it back in the jar and pour in four more ounces of acetone. Swirl well and let it set another day.

Repeat the process and you should have pure, oilless powder. Don't let this get up your nose or the noses of anyone you don't want out of the way.

Castor Bean Oil Press and Final Ricin Progress

By KURT SAXON

If you really like to improvise, just use a No. 15 can from your kitchen and maybe a half dozen lids from other No. 15 cans. The material to be pressed is put in the bottom of the can, the extra lids are put in on top and a bed leg is lifted and then lowered into the can, exerting 60 or more pounds of pressure and more while the bed is being slept in.



Pressing oil is simple. First you dissolve one teaspoonful of lye in a cup of water and put the seeds in. Put a weight on them to keep them submerged. Soak for one hour. Dry them and remove the hulls with your fingernails. You might use a pliars to squeeze the seeds from opposite ends until they crack open. This makes it easier to pick off the hulls.

When hulled, spread the seeds between sheets ■ paper and mash them all with a hammer. When they are thoroughly mashed, scrape them off the paper and spread them thinly in an inch wide strip down one side of a sheet of Bounty paper towel.

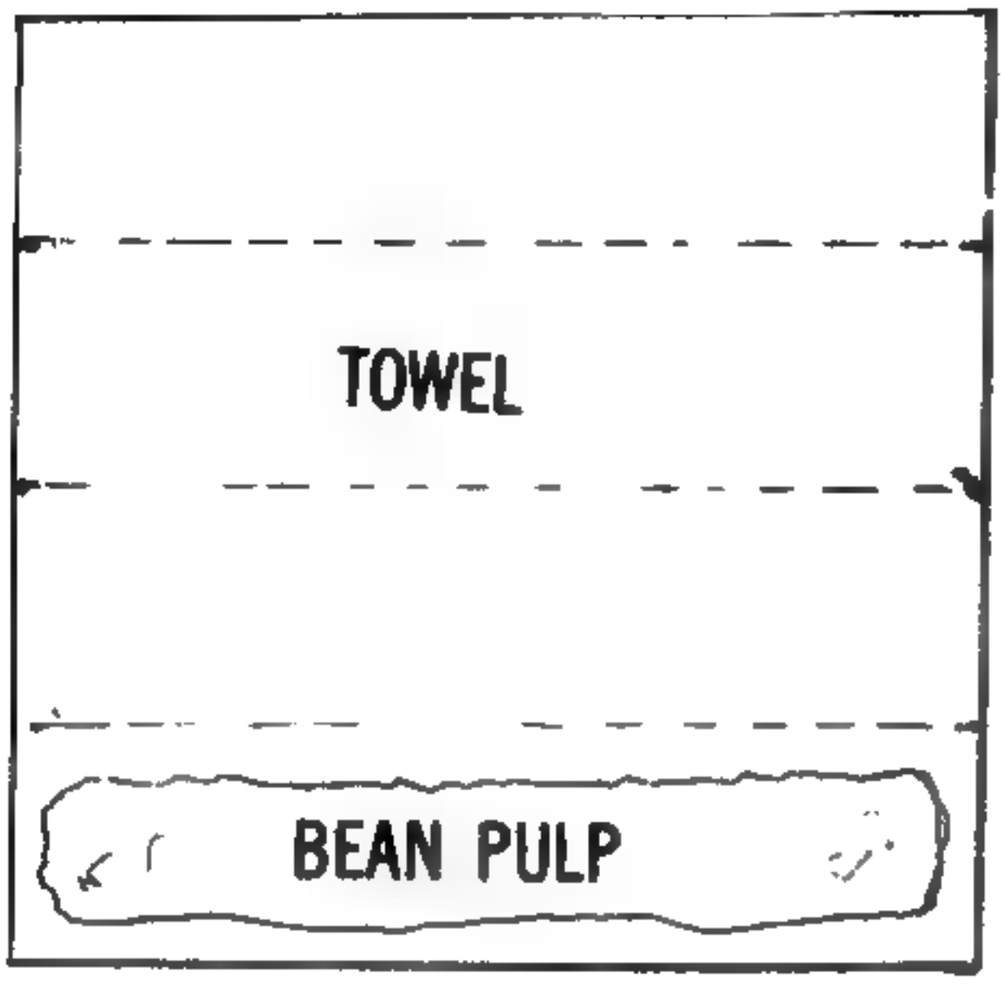
The pulp spread section is then folded over three times so there is two thicknesses of towel on each side of the pulp.

A paper towel is put in the bottom of the can. The four-folded towel is put on the toweling at the bottom. Then another section of towel is wadded or folded to fit the can over the pulp enclosed towel. Next, six or more lids are forced in over the toweling and the bed leg is put in. The number of lids keeps them rigid so the pressure is uniform.

This method doesn't really take any time. Just go about your business while the pressing is going on.

When you feel most of the oil has been removed, pulverize the pulp and put it in a jar. Next, mix 3/4 of an ounce of table salt with seven ounces of water. Pour it in with the pulp, put on the lid and shake the jar vigorously. Shake it as often as you like but leave it in the saline solution for about 48 hours to let the albumin dissolve. Then strain it through a coffee filter.

When strained, you might squeeze the filter full of pulp to remove some more of the liquid. Then dispose of the



pulp.

Next, mix one teaspoosful of Epsom salts in three ounces of water. Pour this in the container holding the liquid left after straining the pulp. Stir and after a few minutes you'll see white flakes precipitating out of the liquid and falling to the bottom. These flakes are the ricin. After a half hour or so, pour the liquid into another coffee filter. When the liquid has drained away, what you'll have in the filter is some pretty pure ricin.

Dry it in an unventillated cabinet and gently scrape the ricin from the filter paper. Once it's dry, during the scraping process and from then on, wear a dust filter mask (bought at any pharmacy) as a fleck or two up your nose should be enough to kill you.

Ricin Bullets

A while back, NBC Magazine showed the 357 Magnum Teflon coated bullets which would go through three folds of Kevlar body armor. Such bullets cost about $35.00 per box of 50.

Much was made of the idea that their only practical application would be for assassination. I agree. Few criminals wear Kevlar vests. Some police and most politicians wear them.

Since most cop killings are close up and spur-of-the-moment, such bullets would seldom be used. But they would be bought mainly by terrorists or criminals whose activities would raise their risks of confrontation. No professional assassin would use a pistol anyway against a target surrounded by bodyguards. He'd use a rifle and go for a head shot. And a deranged person wouldn't be so selective in weapons, buying the cheapest gun or using whatever he already had, usually.

Nor would such bullets be useful against foreign invaders or local marauders. Kevlar body armor is too expensive to be supplied to communist regular infantry and if marauders had the foresight to buy such armor, why wouldn't they stock up on food so they wouldn't have to maraud in the first place?

My main objection to reliance on such a bullet is that even though it will penetrate Kevlar and a 357 Magnum makes a pretty nasty wound, one can still survive if no vital spots are hit. If you know enough of anatomy and are a good shot, why not [redacted] for the head?

No matter. My ricin bullets make debates on the Teflon bullet academic. Whereas one can survive a hit from a 357 Magnum, even a minor flesh wound would be fatal if a ricin bullet were used.

The average concealed weapon, especially among women, is the .22. The .22 Stinger is a fantastic little bullet which splinters and really tears the flesh.

I hate to hear people put down such bullets over the general fantasy that the attacker might be a big, beefy, doped-up, enraged brute who can't be stopped with anything less than a .45. You must realize first of all that a criminal wants something for nothing. Whether he wants your wallet or wants to humiliate a woman by rape, the profit or thrill is gone if he's hurt. So if he's shot, his first consideration is to not get shot again, regardless of the caliber.

And if he happens to be the psychotic fiend he might turn out to be, any resistance, or even lack of it, might get you killed. If you mean to resist, resist with deadly force. If you're going to die anyway, you'll have the satisfaction of knowing you're taking him with you. In the event that he's a "non-violent" mugger or rapist and flees after one shot, and a flesh wound at that, you still might as well rid the world of him.

Incidentally, it's a Federal offence to own or use poisoned bullets. But who's to know? Unless you tell someone, I can see no way anyone, much less the Feds, could find out.

Say you're attacked, for whatever reason, by a degenerated street punk. He knows his territory. He's not going to jump you when there are cops or a significant number of witnesses around. He has no police protection; no concerned witnesses on yours or his behalf. He belongs to you!

One .22 Stinger, or any make, in the kneecap (easy even for the untrained) or the hip or upper leg will let him know he's hurt and will usually down him. If he's just a mugger or rapist he'll know his cause is lost and he'll just want to get away. In the meantime, you just walk away and never even consider reporting your action.

Regardless of what you do to him, he still doesn't want to be jailed for what he tried to do to you. If wounded, he doesn't want to [redacted] to a hospital where he would be questioned. Even so, he'd probably say another punk shot him, rather than any victim of his.

Such persons often know a back-alley, unlicensed doctor to crawl to when hurt while in the commission of a felony. So when he dies a few days later of ricin poisoning, he'll just be another derelict found dead in a dirty tenement sleeping room.

Even if he did die in a hospital days later of "pneumonia", it wouldn't be likely that they'd suspect ricin. His illness would probably be listed as a complication caused by his lowered resistance to disease. If he died in the hospital, even after identifying you, you'd have a much better chance of the thing blowing over than if he lived to sue you for defending yourself.

Your basic consideration in carrying a concealed weapon, ricin bullets or no, is that there is virtually no

way of being detected as long as you are minding your own business and don't tell anyone. If you are threatened, don't let fear of reprisals by society outweigh any present danger. It's always best to be judged by twelve than carried by six.

To arm your hollow-point bullets with ricin, just put a drop of water on a small pile of ricin and make it into a paste. Then smear it into the hollows until they are full and set them aside for a few days to dry. Then put a drop of Elmer's glue over the hollow to seal it.

The opening in Stingers and other hollow-points can be enlarged by using a ball point pen. Before putting on the glue take a pair of small pliars and, using a bit of rubber or leather to avoid damage, crimp the hollow back to its original sized opening.

Ricin Update

By KURT SAXON

My original ricin was quite effective, being extremely potent even in the form of hulless, de-oiled castor bean powder. However, it wasn't really professional, since it couldn't be called pure.

Several readers sent in methods to get a purer product. But John Minnery's contribution of the government formula, which ■ for manufacturing ricin as a military weapon, ■ the ultimate.

It calls for castor beans to be ground, heated and pressed.

United States Patent Office

1 3,060,165

Patented Oct. 23, 1962

3,060,165
PREPARATION OF TOXIC RICIN
Harry L. Craig, Cincinnati, and Otto H. Alderks, Wyoming, Ohio, and Alseph H. Corwin and Sally H. Dicke, Baltimore, and Charlotte L. Karel, Silver Spring, Md., assignors to the United States of America as represented by the Secretary of the Army
Filed July 3, 1952, Ser. No. 297,142
2 Claims. (Cl. 260—123.5)

This invention relates to the method of preparing toxic ricin.

Ricin is a protoplasmic poison prepared from castor beans after the extraction of castor oil therefrom. It is most effective as a poison when injected intravenously or inhaled, the latter requiring extreme comminution and small particle size to be effective. It is believed that the toxic action is catalytic rather than stoichiometric which probably accounts for the high toxicity of the agent.

Because of its relative instability, ricin must be handled with extreme care. In neutral aqueous solution it is stable only up to 60°–75° C., and in solid form up to 100°–110° C., although for short exposures, temperatures up to 130° may be tolerated. It is sensitive to acids, alkalis and halogen and may also be inactivated by mechanical working such as grinding or pulverizing. These factors are of great importance ■ developing a satisfactory method for preparing the material.

Although ricin has been prepared in crystalline condition in the laboratory ■ small quantities, it becomes necessary, for purposes of toxicological warfare, to prepare relatively large quantities in a high state of purity. This necessitates that as much as possible of the non-toxic material present be removed in the process.

In preparing the protein material, the castor beans are first ground and pressed to remove most of the oil. The pressed cake still retains about 15% oil and this may be removed by means of solvents which will extract an additional 150 pounds of oil per ton of beans and reduce the oil retained in the cake to a little over 1%. ■ the event that the expressing step ■ supplemented by solvent extraction, it is important to prevent detoxification of the protein during the solvent removal step. If residual solvent is removed from the ground beans by blowing with steam, considerable detoxification results. Blowing with nitrogen effectively prevents detoxification but is expensive when carried out on a large scale.

After the oil has been removed, the pressed cake or pomace is extracted by agitating with water ■ a pH of 3.8±0.1 at 25° C. which removes substantially all of the toxic protein. The extraction process is operative within a pH range of about 3 to 4.5 although the preferred range is about 3.5 to 4. The optimum operating point is a pH of 3.8±.1, as indicated above. A careful pH control is essential in order that as much non-toxic protein as possible may be eliminated and also that the filtration rate may be held at a satisfactory value. Either HCl or H_2SO_4 may be used to get the desired pH for the extraction water, but H_2SO_4 is preferred due to its lower corrosion rate and ease of handling in concentrated form. The acid should be used in reasonably dilute form to prevent undue local concentrations during its addition. A 5% concentration is satisfactory.

Following the extraction, the slurry is filtered using either a conventional recessed plate filter or a continuous string discharge vacuum filter. With the latter about 7% of filter aid based on meal weight, was found necessary for satisfactory filtration.

The filtrate from the water extraction step, which contains the ricin, was treated with a 16.7% solution of Na_2SO_4 to precipitate the protein. This solution is com-

posed of 20 pounds of salt in 100 pounds of water and the amount used was such that the salt content equalled 20% of the filtrate weight. This amount and concentration of salt solution was about optimum considering the factors of cost and toxin recovery. Somewhat higher concentrations and larger amounts of solution can be used, however.

The precipitation process is not limited to the use of Na_2SO_4, since a saturated solution of NaCl can be used successfully, but Na_2SO_4 solution gives better nitrogen fractionation, more rapid precipitation, and can be operated under wider pH limits. It is desirable to raise the pH to about 7–8 before precipitation as this gives better recovery and greater non-toxic nitrogen removal. The pH was raised to this value by using NaOH or Na_2CO_3, the latter being preferred. The base used was quite dilute in order to prevent detoxification due to high local concentrations in the solution. A 5% solution of NaOH was used, whereas with Na_2CO_3 a 12% solution was preferred. In general, this higher pH during precipitation gave a greater non-toxic nitrogen fractionation and at the same time maintained the toxin loss ■ less than 2%.

After precipitation, the slurry was filtered using from 1 to 4% filter aid, based on slurry weight, for satisfactory filtration; the amount of filter aid needed being dependent on the type of press used. Washing the filter cake with Na_2SO_4 solution removed additional non-toxic nitrogen which is desirable. In this washing step a 16.7% solution of Na_2SO_4 was again used. This washing step removed an additional 15% of non-toxic nitrogen from the cake.

After filtration the filter cake, which contains the ricin in combination with the Na_2SO_4, may be dried and slurried with CCl_4 to separate the ricin by flotation. Separation of the ricin after a single precipitation and washing step is possible, but it is preferred to carry the process through an additional extraction and precipitation step. This is accomplished by slurrying the filter cake in three times its weight of water and the pH of the slurry ■ again brought to 3.8±.1 by means of 5% H_2SO_4. The slurry is filtered and a second precipitation is brought about by adding Na_2SO_4 solution.. Although pH control here is not wholly essential it is advantageous to bring the pH to approximate neutrality by adding 12% Na_2CO_3. A precipitation time of 45 minutes was necessary to obtain complete removal of the toxin. In filtering out the precipitate, no filter aid was used and the filter cake was washed with Na_2SO_4 solution on the filter whereby an additional amount of non-toxic nitrogen was removed from the cake. This washing was effective only the first time and repeated washings had little effect in removing further non-toxic nitrogen.

The ricin-Na_2SO_4 precipitate was dried at about 50° to 60° C. on a hot air tray dryer. The dried product was ground to pass a 40 mesh screen and agitated with 5 times

its weight of CCl_4, which served the separate the ricin from the Na_2SO_4 by flotation. After settling, the ricin was skimmed off the top. This reduced the Na_2SO_4 content of the mixture from a previous 40 to 50% down to 15 to 18%. About 1 to 2% of nitrogen remained in the Na_2SO_4 salt which could then be used for subsequent precipitations.

The final precipitation produced a particle size of 1–2 mu. On drying the wet cake, however, the ricin cemented together forming larger particles. These could not be broken down to their original size by ordinary grinding methods and since a very fine particle size was necessary in order that the product might be used as a toxic weapon, it was thought desirable to seek some method to prevent the agglomeration or cementing process that took place on drying.

To attempt to affect this result, physical conditions prevailing under the precipitation process were changed

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This included changing the temperature of precipitation and the rate of agitation. Other changes included precipitation with only partial saturation of Na_2SO_4 and the use of wetting and seeding agents. None of these expedients produced any significant improvement in particle size.

Ordinary dry ball and hammer milling of the dried ricin produced considerable detoxifiation perhaps due to the generation of excess heat. The use of CCl_4 slurry plus the use of low temperature and low moisture content of the ricin reduced detoxification during ball milling.

Spray drying proved to be an even better method of securing a reasonably small particle size. Best results were achieved by using a solution having about 20% solids, an inlet temperature of 150° C. and an atomizing air pressure of 150 to 180 p.s.i. The particle size secured was 6 to 8 mu.

The best means of securing a small particle size was by air grinding. This was carried out in an apparatus having a chamber with conical top and bottom. The material to be ground has been fed into this chamber and is withdrawn from the bottom and forced back into the center of the chamber tangentially through a venturi. Compressed air of about 100 p.s.i. was fed to the venturi to provide the grinding force. The fines are drawn off the top and the large particles settle to the bottom to be recirculated and reground. This process produced particles having a mass median diameter of 2.5 to 3.5 mu.

4

Numerous variations are possible in the several steps of the process commencing with the water extraction and precipitation which may be a single or multiple step. Although a single extraction step can be used, as indicated before, some process modifications are necessary for its successful operation on a plant scale. Double extraction proved to be quite efficient but additional steps beyond the second extraction step were not found necessary.

The drawing is self-descriptive and shows the various steps of the process described.

We claim:

1. In a method of preparing toxic ricin from castor beans comprising slurrying an expressed castor bean cake with water to remove the water soluble ricin and precipitating the ricin from the filtrate, the further steps which include slurrying the precipitate with CCl_4 and separating the ricin by flotation.

2. A process in accordance with claim 1 in which the precipitate is dried prior to slurrying

References Cited in the file of this patent

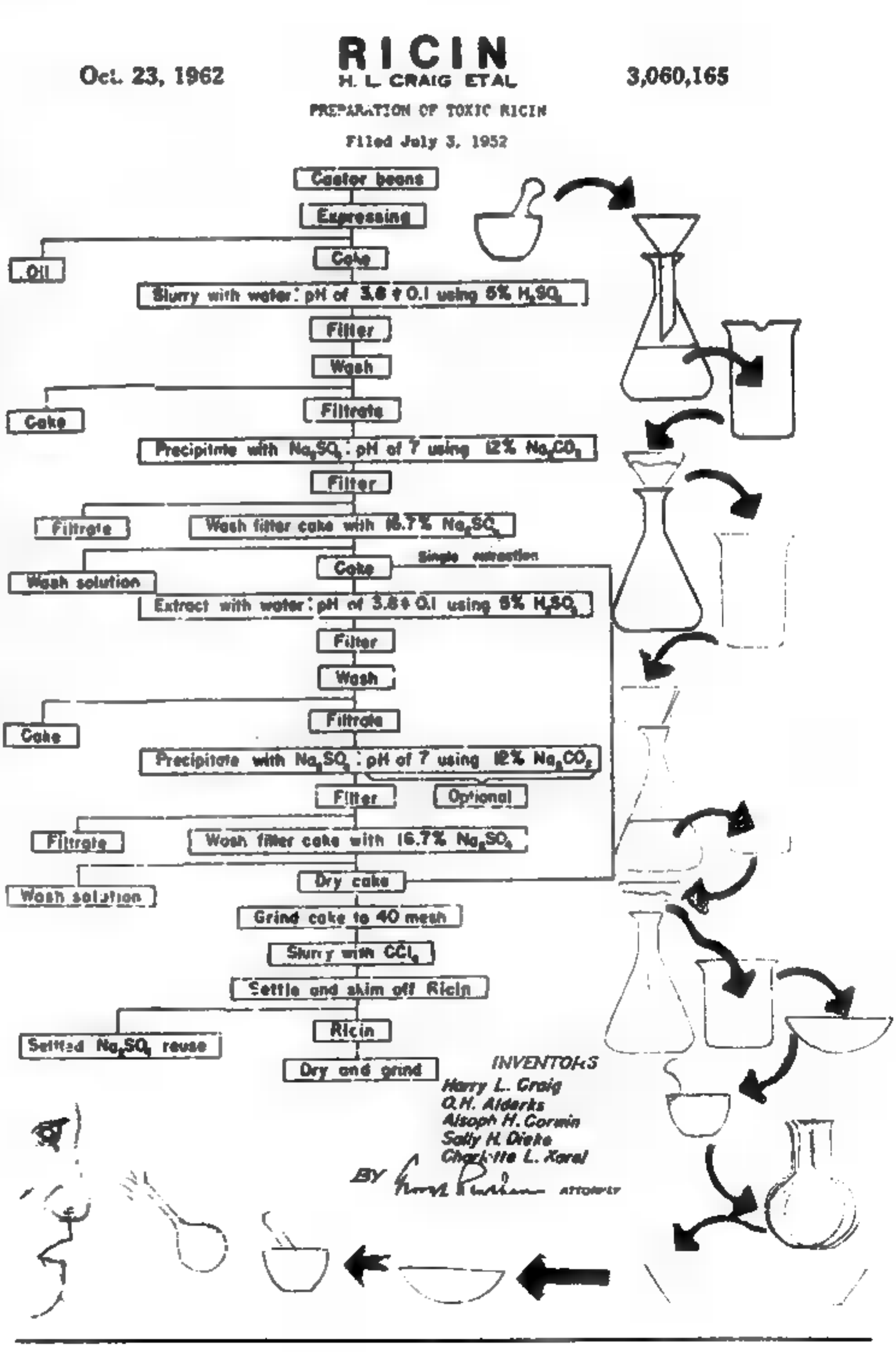
Kabat et al.: J. Biol. Chem., vol. 168, 1947, pages 629–39.

Kunitz et al.: J. Gen. Physiol, vol. 32 (1948), pages 23–31.

POTASSIUM PERMANGANATE—GLYCERIN IGNITER

Description: This igniter consists of a small pile of potassium permanganate crystals that are ignited by the chemical action of glycerin on the crystals. It is used to ignite incendiaries and readily flammable material such as rags, dry paper, dry hay, or the combustible vapor area above liquid fuels. Ignition is accomplished by causing a few drops of glycerin to contact the potassium permanganate crystals.

Comments: This material was tested. It is effective but is not reliable below 50° F.



Help!

I've gotten several letters telling me the potassium chlorate process doesn't work for some. I don't know if it's because they can't follow my instructions or if I wrote it wrong.

I updated 4184 — of GRANDDAD'S WONDERFUL BOOK OF CHEMISTRY and put what I thought was an easily understandable diagram on page 6 of THE POOR MAN'S JAMES BOND. It's one of the few I didn't actually test. Rather than do it myself I'll let you figure it out.

If you can't tell me how to do it right, I'll get around to the foolproof process before THE WEAPONEER is completed.

In the meantime, here is the 1872 version and mine. See if you can find any error in my process.

POTASSIUM CHLORATE MAKER (MINE)

When the pan of lye is set up, put two inches of bleach in the bottle and a teaspoon of Sani-Flush and put in the stopper quickly. You won't be harmed by the little gas that will escape during the process but it is unpleasant to smell.

When the bottle stops generating gas, test the lye solution with a piece of red litmus paper. If the paper turns blue it means the stuff is not done yet. Pour the bleach out and give the bottle another dose. When the red litmus paper stays red, that means the lye has been neutralized and the process is finished.

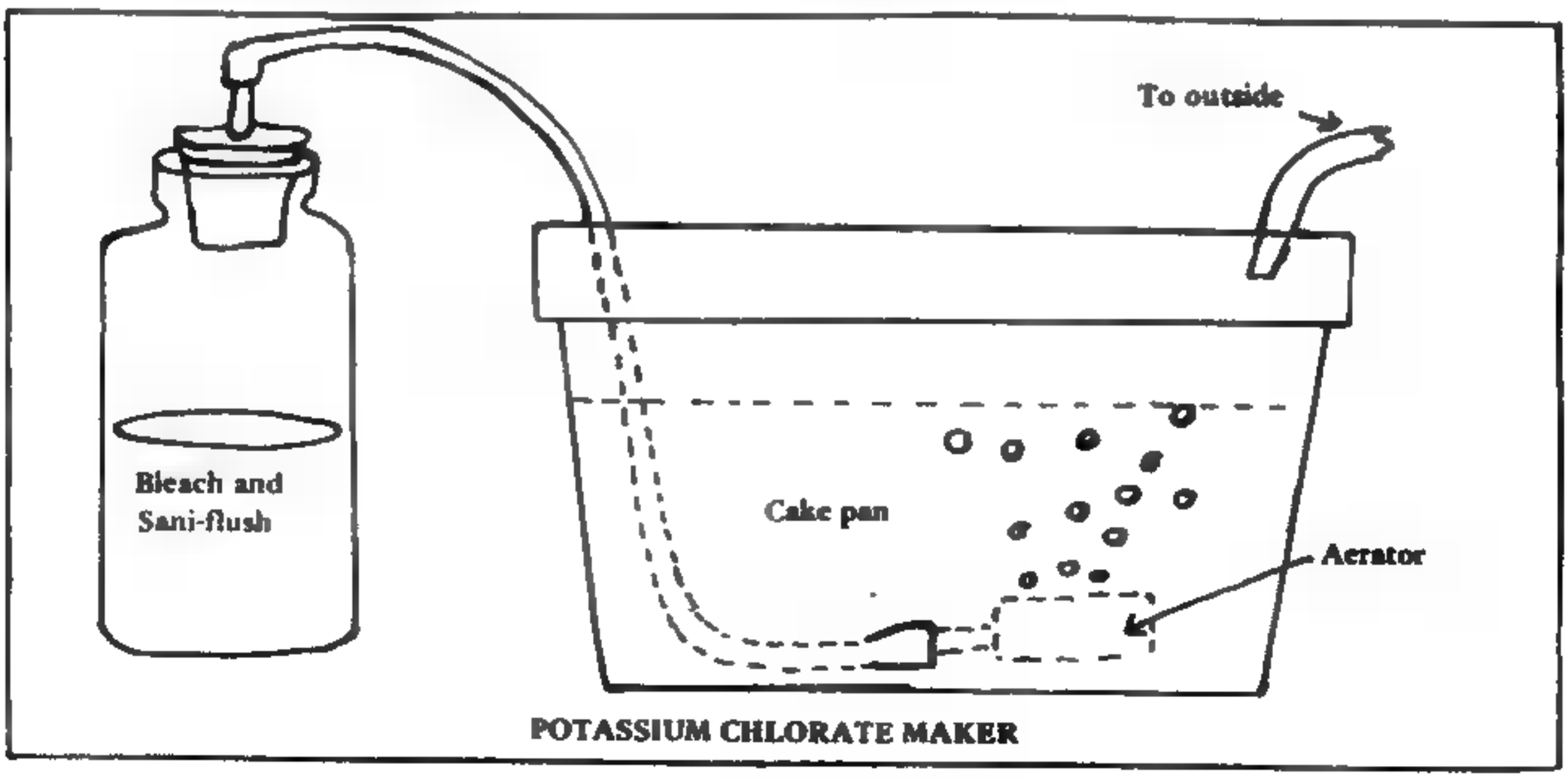
Red and blue litmus paper, for testing acids and alkalies, can be bought at the drug store. If you want the best you should ask for pHydrion paper. This is superior to litmus paper.

When the lye has been neutralized the pan is put on the stove and brought to a slow boil. Then turn down the fire until there is no turbulence on the surface. Let it evaporate this way until a thin layer of crystal forms on the surface. Then turn off the fire and let it cool.

As it cools, four and six-sided, pearly scales will form. After several hours, when all crystallization has stopped, collect the crystals and dissolve them in their own volume of cold water. Put the solution in a smaller pan and repeat the crystalizing process. This time you will have purepotassium chlorate and any impurities will remain in solution.

Granddad's Wonderful Book of Chemistry 1872 Process

Chlorate of Potassa. Transmit chlorine gas through a moderately strong and warm solution of pure caustic potassa, or its carbonate, until the alkali be completely neutralized, then boil for a few minutes, gently evaporate until a pellicle forms on the surface, and set it aside, where it will cool very slowly. Crystals of the chlorate will form as the liquor cools, and must be collected, carefully washed with a little ice-cold water, and purified by resolution and crystallization; the product is pure chlorate of potassa. The mother liquor, which contains much chloride potassium, by evaporation will yield more crystals, less pure than the former, or it may be saved for a future operation. This salt crystallizes in four and six-sided pearly scales; dissolves in 16 parts of water at 60°, and in 2½ parts at 212°. At about 450° it undergoes the igneous fusion, and on increasing the heat almost to redness, effervescence ensues, and fully 39 percent of pure oxygen gas is given off and the residue becomes changed into chloride of potassium. When mixed with inflammable substances, and triturated, heated, or subjected to a smart blow, it explodes with great violence. It also fulminates when thrown into strong acids.



POTASSIUM CHLORATE MAKER

Potasium Chlorate

Dear Mr. Saxon:

I checked the potassium chlorate process and it is correct. The only thing wrong with it ■ that you've shown the aerator which conducts chlorine gas into the solution near the bottom of the pan. This is unwise because of the increased hydrostatic pressure which could prevent the chlorine from bubbling through the solution. To remedy this, put the chlorine delivery tube just beneath the surface of the solution. I have checked out the chlorine generating system with bleach and sodium bisulfate. It does work, but the pressure is rather weak so for some people ■ may not bubble through the solution properly. A more intense pressure can be obtained by using hydrochloric acid and bleach. I have used this system successfully in the past when I was doing a synthesis of chlorobenzene. (There have been some complaints about the Chloral Hydrate Process in the PMJB. Ed.)

As for your problem with the sysnthesis of chloral hydrate, I don't know what's wrong with that, if anything. As far as I can tell the synthesis should work as long as you can get the chlorine to bubble through the alcohol (see my comments above about hydrostatic pressure and the remedy).

One more word about potassium chlorate: If for some reason you can't get the chlorine to bubble through and can't afford a compressor to do the trick, there is a simple way to make it without using chlorine directly. Take 5 lbs. of calcium hypochlorite (bought at a swimming pool supplies company under the name HTH), add enough water to dissolve it completely and then boil the resulting solution for about half an hour. Then add 6.1 lbs. of potassium sulfate (bought at a nursery or garden supply store) to the solution. Calcium sulfate will immediately precipitate and after filtering the hot solution to remove it, the solution can then be boiled until potassium chlorate begins to crystalize out. The beaker is then set aside to cool and after the precipitation stops the potassium chlorate is collected by filtration.

One final note. If you use gum rubber tubing, it will be eaten away by the chlorine gas and you will also risk contaminating the solution with chlorinated hydrrocarbons. Use neoprene or other resistant tubing to correct this minor problem.

J.S.

THE BLOWGUN

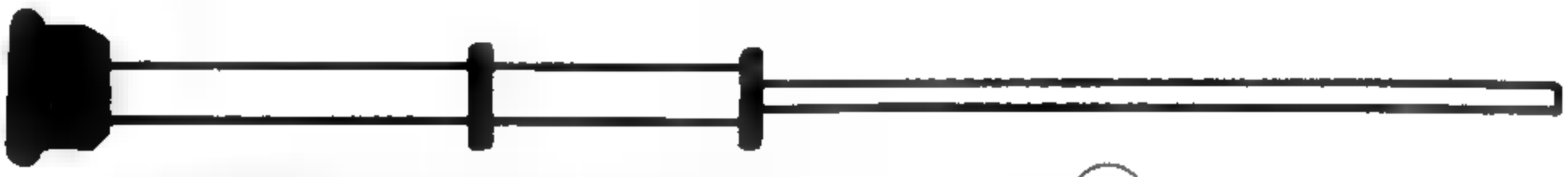
Last week I was at the Tulsa gun show and bought a 4½ foot camouflaged blowgun. It came with several yards of steel wire and 100 plastic beads. I found it amazingly easy to aim and use.

It is indeed a deadly weapon. It has an effective range of 60 feet and will still stick at 200 feet once you learn to give it your best blast of air. It is also light and silent. I want you to order one as I'll discuss it further in the next issue. I guarantee you'll consider it one of the best weapons in your arsenal.

It costs only $16.50 for the camouflaged ($2.00 less for the plain) and comes with enough darts to keep you fascinated for hours. At the end of a few hours you'll be able to hit a six inch circle at 60 feet every time. An enemy across the street would be ■ dead piegon in a few minutes or a few days, depending on whether you used the potassium cyanide-mucilage coating or the detachable ricin coated barb described on page 38.

A blowgun can be used for hunting any small game — birds, rabbits, squirrels, even fishing. It has been used effectively on 35-lb. raccoons, in Texas on armadillo, and in Kansas on a 10-lb. fish. A head shot or vital organ shot will bring down your game.

The shooting range depends on the length of the gun and the amount of air you put behind the dart. Just a **quick puff** of air sends the dart on it's way — **WARNING, DO NOT INHALE THE DART**. The 4½' gun has a range up to 200'. As the length of the gun increases, so does it's effective range. With practice you can develop velocity of 300' per second.



A FINISHED DART WILL LOOK LIKE THIS . . .

At 20' to 25' ■ 3-inch dart can penetrate two pieces of quarter-inch plywood. At the same distance ■ 6-inch dart can penetrate three pieces of quarter-inch plywood.

Darts are made of wire, cut to the length you desire, and a hard plastic bead on one end. Recommended lengths — small game — 3 to 7 inches, fishing — 7 to 10 inches.

The price of each gun includes the gun, sturdy carrying case, enough material to make 100 three-inch darts, and an instruction sheet.

**NOTE: Check local fish and game laws before taking game animals.

Killer Darts

By Kurt Saxon

The simplest, cheapest, quietest and most efficient missile is a poisoned dart propelled from a blowgun. It is also safest for the blowgunner, as the enemy could not be sure where the missile came from or even what it was, in time to react.

With a little practice, the average person with good lungs can put darts in a target the size of an orange from 30 to 60 feet every time. This skill will enable you to pick off a prowler outside or down an intruder in your home. For fun practice you can sit in the passenger's seat of a parked car downtown and zap pimps, prostitutes, fags, politicians and other social derelicts. Just be sure to aim at exposed flesh; face, neck, legs. The darts will penetrate skin-tight clothing but not jackets or loose pants.

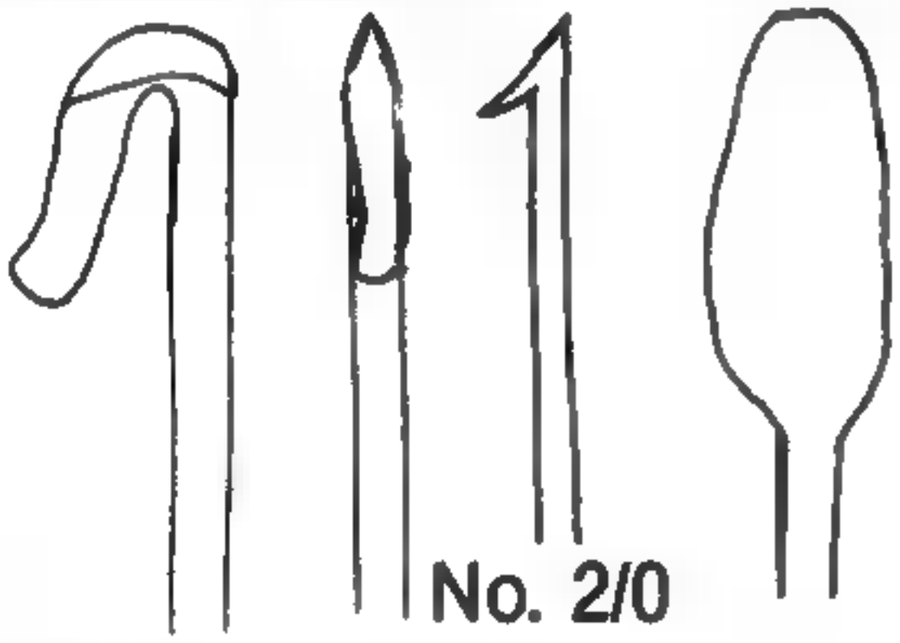
The regular wire-plastic bead dart from three to seven inches are best for practice but can be pulled out of the flesh easily. This makes them inadequate as lethal missiles.

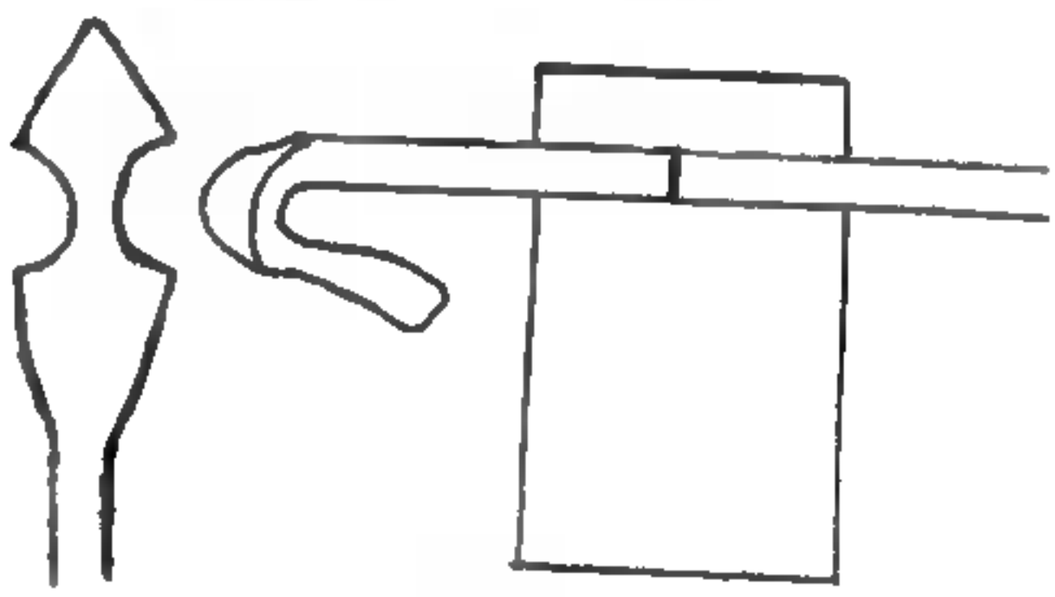
By bending the wire back on itself about a quarter of an inch and sharpening it on a grinder, you will make it difficult to remove. If you want it impossible to remove with the fingers, cut the head off an inch from the tip and roll a half-inch of Scotch tape around both pieces. If the victim pulls the dart, the head will disengage and stay in the flesh. Even if some is projecting, it would take a pair of pliars to remove it.

Fish hook barbs are best but the bronze colored ones break. Try to get No. 2/0 silvery hooks. Bend straight and cut to suit.

The basic wire dart is best for ricin. To coat its head with ricin, mix just a drop of water with a little pile of ricin powder and roll the dart head in it. Wipe off any from the sharpened tip and let it dry.

Ricin tips are for an enemy you want to knock off without a stir. He'll probably think he's just the butt of a nasty practical joke. Unless he called attention to his plight, bystanders wouldn't react.





The quick-killing dart is made from coathanger wire which is heavier and provides the greater surface area to hold the cyanide.

To make darts from coathangers, snip six and a half inch lengths from the straight areas. You will get four darts from each hanger. Heat the ends and put on the plastic beads in the same way you put them on the wire darts.

Then use an anvil or some other block of steel and hammer the tip flat about three quarters of an inch back from the tip. Next, using a grinder or a file, notch the tip on both sides and make a point. The notches will make the tip hold firmly in the flesh.

Cut the head off just a little over an inch from the point. Grind or file smooth both ends of the dart where it was cut so the ends will fit flush with each other when you roll the Scotch tape around the tip and the shaft.

Coating the point with potassium cyanide is the tricky part. Cyanide has to be bound with a substance which will keep it hard and make it penetrate the flesh. I find the best substance to be lePages or Ross mucilage bought at any store in the school supplies section. The rubber applicator should have its slit cut wider so the mucilage can be squeezed out a drop at a time.

The books say a lethal dose is from three to five grains. Get five grains of rice to compare your small piles of cyanide with. To make the cyanide easier to work with, mash it to a fine powder with the bottom of a spoon. It's best to dry off a section by the bathroom or kitchen sink to work with the cyanide. This will give you a hard surface to mash the cyanide and washing up easy.

After powdering, scrape into piles and put one drop of mucilage on each pile. Take a dart tip and mash the glue thoroughly into the cyanide piles. Then pick up the mixture on the dart head and with the thumb and finger, mold the mass around the flat surfaces. sure to wash your hands when you've finished. If you're going to make more than three or four you ought to wear rubber gloves.

The mass tends to sag so it must be laid flat to keep its shape. Also, since cyanide attracts moisture, will never dry by itself. It must be baked in an oven at between 200 and 250 degrees F. for about minutes.

However, baking it creates a gas, so unless confined, it will bubble and spread into a shapeless, hard, mess. To properly confine it during baking, cut strips of aluminum foil one inch by three. Spray one side with

Cook Ease or any other non-stick spray and let it dry.

Roll the aluminum foil around a pencil with the Cook Ease inside. Then stick the dart tip in and carefully press the aluminum tube around the shape of the dart tip and the cyanide. As it bakes, the gas will escape through the ends and the cyanide will stay confined and form into a rock-hard mass. A little practice will give you uniformly coated dart heads. Be sure to file any cyanide off the sharpened point of the dart.

Since the cyanide attracts moisture, the finished dart heads, Scotch taped to the shafts, should be stored in plastic baggies with all the air pressed out before sealing. This will keep them dry.

When ready to use, they should be carried in the shirt pocket with their tips resting in a plastic bottle with the top cut off and used as a quiver. This way, the tips won't rub against one another, breaking the cyanide or loosening the Scotch tape connections. Out of their plastic coverings, they will last several hours before attracting enough moisture to soften them.

To test how long it would take to dissolve the cyanide, I held it under blood warm water from the faucet. In 15 seconds it was gone. When a missile penetrates the flesh the flesh tightens on it as Nature's way of decreasing loss of blood. Also, great amounts of blood flows to the wound area to carry away any foreign matter. So the dart head in the flesh should be free of cyanide in 15 seconds and in 30 to 60 seconds the enemy should be as dead as a door nail.

If the urban guerillas in Afganistan should use cyanide darts from blowguns, no Russian would be safe. The quickness of reloading could get any two or three dead before they could locate the source. This silent weapon of the night could rid Kabul of Russian vermin.

After some practice, you should be able to load, aim and hit your target with up to 20 darts per minute. This perfect night weapon is an excellent defense against marauders and would make foreign occupation of your territory impossible.

Potassium Chlorate Grenades and Bombs

There's nothing like a case of reliable, devastating grenades to throw at marauders. I favor the potato masher type over the pineapple model. They throw farther, at least for me.

Black powder as a filler is pretty good and pistol powder is great but expensive. Potassium chlorate is fantastic and has great shattering power. It really sends the shrapnel out at an awful speed. It is also relatively easy to get.

Potassium chlorate is unpredictable with fuses. It will go off spontaneously when mixed dry with certain chemicals such as red phosphorous, sulphur, black antimony sulphide, etc. But for controlled situations, most prefer to set it off with blasting caps, since it also detonates by concussion.

It you have access to blasting caps, you can also get dynamite. Dynamite lends itself well to potato masher grenades. So if you can get dynamite, you're all set. Just put a stick of dynamite in a pipe, push in a blasting cap with a length of safety fuse and you're all set.

But if you don't have blasting caps or dynamite you can make do quite well with potassium chlorate. You just need something guaranteed to set off.

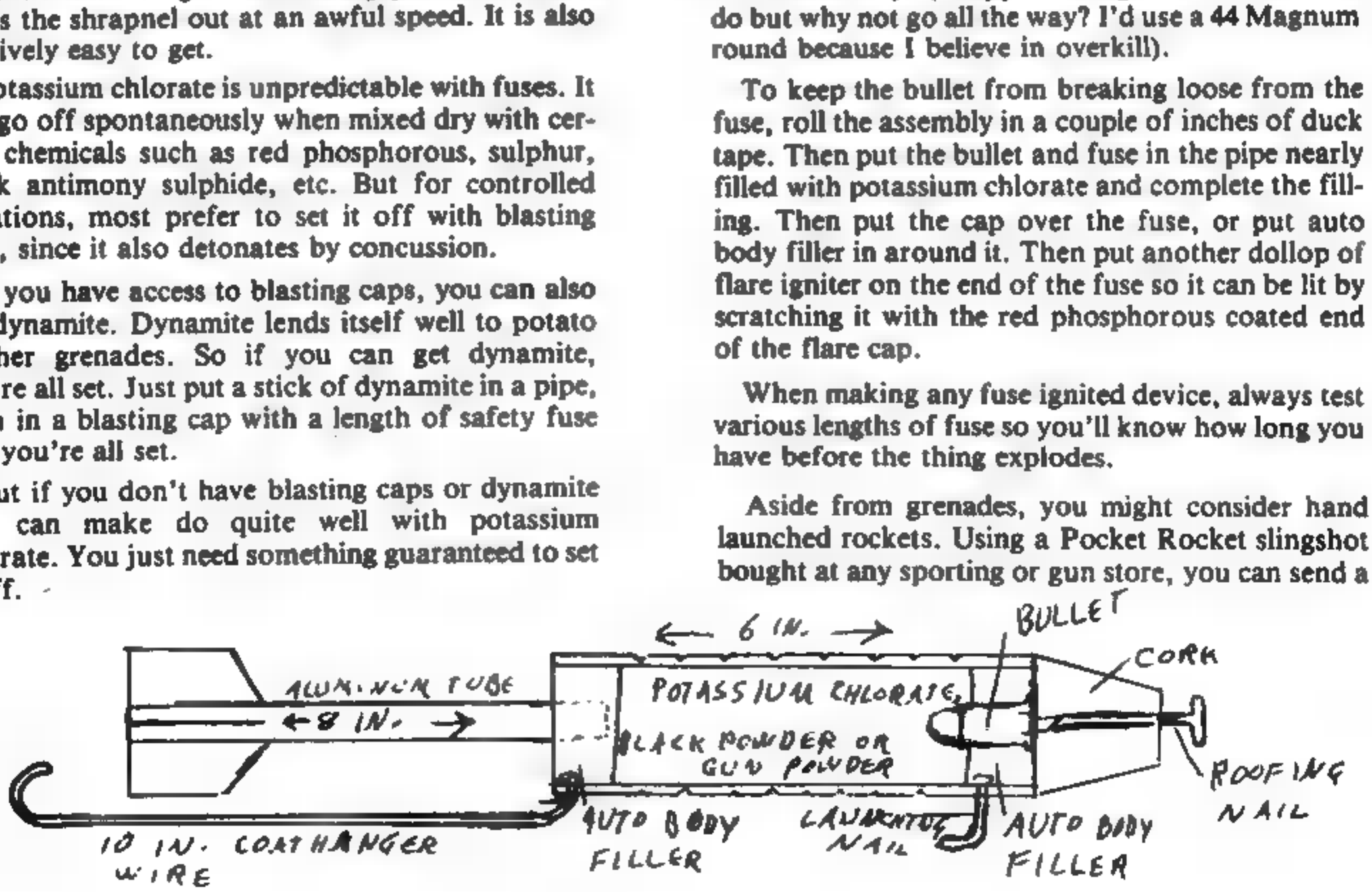
To set off the bullet you'll need some highway flare igniter. (See IGNITERS, page 7 and 8 for fuses and the flare igniter). Since carbon tetrachloride is now almost universally banned, you'll probably have to break up the flare igniter and soak it in its own volume of water overnight.

All you do is put a dollop of flare igniter mush on the end of a 22 LR Stinger cartridge, stick a fuse to it and let it dry. (I suppose a regular 22 LR would do but why not go all the way? I'd use a 44 Magnum round because I believe in overkill).

To keep the bullet from breaking loose from the fuse, roll the assembly in a couple of inches of duck tape. Then put the bullet and fuse in the pipe nearly filled with potassium chlorate and complete the filling. Then put the cap over the fuse, or put auto body filler in around it. Then put another dollop of flare igniter on the end of the fuse so it can be lit by scratching it with the red phosphorous coated end of the flare cap.

When making any fuse ignited device, always test various lengths of fuse so you'll know how long you have before the thing explodes.

Aside from grenades, you might consider hand launched rockets. Using a Pocket Rocket slingshot bought at any sporting or gun store, you can send a



rocket on the order of the incendiary on page 31 of the PMJB a couple of hundred feet with deadly accuracy.

(Although the Pocket Rocket is far more powerful than a regular slingshot, it has one drawback. The nibs which connect the leather strap which holds the PR to the wrist are not fixed. In use, the nibs tend to work off and the PR can fly back and clobber you in the mouth. Work the nibs off, fill them with epoxy and put them back. That way the PR will never come apart).

The pipe of the explosive rocket would be iron plumbing pipe rather than aluminum. Instead of lighting the fuse, you'd want it to go off on impact. For this, turn to page 15 of the PMJB. Use a bullet, but one with a primer instead of a rimfire 22. When you have all the potassium chlorate in, put in the bullet and surround it with auto body filler.

HAND LAUNCHED ROCKET

If you'd like to jazz up your rockets with fins, you can shoot them up and rain rockets amidst groups of marauders. With a few of these, after some practice with dummy rockets of the same weight, you can eliminate any number of marauders too far away to throw at.

From page 25

fire by foot-soldiers in armor, or by men on horseback or in chariots of war. The torch borne by the foot-soldier, or by the horseman, was used often for the purpose of setting fire to the wooden works of the enemy, or to heaps of combustibles previously piled up before a gate or other point assailed. There are accounts, also, of large bodies of men being thus armed to operate against a hostile force in array upon the open field. But this method of warfare could not be employed with advantage except when there was a strong wind blowing from the position of the assailants toward that of the assailed. In this case the advancing line would be preceded by a cloud of smoke, consisting of the most poisonous and suffocating vapors, before which no human being could stand.

The lances used in these cases were formed with an iron receptacle for the fire at the end. This receptacle terminated in points at the extremity, which formed a very efficient weapon after the fire was exhausted, or even perhaps while it continued to burn. In the case of the horseman the shank of the lance was supported by a ring open at the top, fixed upon the horse's head, and the horse as well as the man was covered with an iron armor, in order to protect them from any sparks or flecks of flame which might be driven against them by the rapidity of the onward motion, notwithstanding the precautions taken in respect to the direction of the wind.*

Of course combustibles carried in this way could not be sufficient in quantity to burn for a long time. It was necessary to calculate the possible duration of the fire very accurately, and to act, after the fires were once lighted, with great promptness and decision. The object of the enemy, it is plain, in case of such an attack, would be to gain time by falling back, or by deceiving the assailants as to the distance, so as to allow the fires time to burn out. One conspicuous example is given in a combat between the forces of the Sultan of Egypt and those of a Mongolian Khan, which took place in Syria, when a body of Egyptians, armed with lances carrying Greek fire, suddenly appeared issuing from the ranks, and advanced across the intervening plain toward the enemy. But they had in some way or other so miscalculated the distance—or the duration of their fires—that the combustion exhausted itself before they reached the Persian lines. The Persian commander then ordered a countercharge upon them. They were thrown into confusion, and in falling back to their own lines carried confusion with them, and their whole army was put to flight.

The marvelous tales which have been told in

Big Brother is Watching Lawrence

By Kurt Saxon

For years I've been accused by the news media of corrupting people, especially the young, by giving them the knowledge to destroy their enemies. Of course, I don't direct such knowledge toward youngsters but they are attracted to the macho publications my ads are in. Luckily, most of those youngsters have the intelligence to realize that deadly force, except in actual self-defense, must be backed up with the wisdom ■ maturity.

After selling over 50,000 copies of THE POOR MAN'S JAMES BOND, there has not been one report of any youngster hurting himself or anyone else. You can be sure the media would love to smear me with a story of one of my young readers destroying all life forms in his neighborhood. (See "Tylenol Interview", page 65). Even so, it wouldn't bother me unless I lived in that unfortunate community.

Actually, THE POOR MAN'S JAMES BOND is a real deterrent to crime. It forces the reader to accept responsibility for his actions toward others.If he uses it unwisely and is so stupid as to be caught, he can't plead crime of passion, insanity, or any other cop-out. The judge would say, "You ordered it, you used it, therefore it was premeditated, so I'm going to have them lead you off".

The letter I've reproduced below is from one who fears responsibility. His fear of freedom is obvious. He is a tribalist, as described in my editorial, "The Citizen Menace". And rather than turn him loose on society, I've made him tractable and docile, as all tribalists should be.

As in George Orwell's "1984", which I think he's read, I'm his O'Brien, giving him "The Book" which will stimulate his latent urges for freedom. ■ his mind, the purpose is to seduce him into thoughtcrime. Big Brother ■ now aware of his unorthodoxy. The Thought Police will eventually pick him up, and ■ Room 101 ■ the Ministry ■ Love, all unorthodoxy will be tortured out of him and he will finally know that, for inferiors, Freedom is truly Slavery and Ignorance ■ truly Strength.

An obvious teenager, reflecting the lack of intellectual discipline it takes to communicate, he can neither spell nor arrange his ideas in any logical pattern. Read his letter out loud to yourself and see if it doesn't sound like the gibbering ■ a terrified monkey.

"Dear Mr. Saxon:

I think your poor man's James bond sucks! And all the rest ■ the books that you publish. I know that you are a agency of the United States. Its totally ridiculous the methods that you employ here. Were taught from very young about history, the government, constitution rights this and that. We learned it all through reading! You read the papers everyday about crime, war, polatics, right! So here you go around wondering about how bad things really are right. So now you get the blues and your wondering what to do. You pick up a magazine and read your advertizement, send for and receive it. Here you read all this nasty stuff, that was of course your ideal and ideals! I would have never guessed how to make this stuff ■ you havent furnished the information. It seems totally cartrated what this country stands for! It seems you should practice what you preach! I feel I lost my right to privacy. Oh well, stick it in your computer. Your false and misleading advertizment seems to break the law. When you read

respect to the power of the Greek fire to burn under water have a certain foundation in the fact that, in the times when this agency was employed in war, the method of using it was by packing the materials in a spherical receptacle, in such a manner that when thrown into the water the missile could go down to a certain distance without being entirely extinguished, so that on rising again to the surface the flames would break out anew, ready to set fire to any combustible object that they might encounter. The engraving on page 40, copied from one of the ancient illustrations, gives a general idea of this operation. The balls thrown from a height into the water would of course sink below the surface, until brought back again by their buoyancy; and there would be no great difficulty in so storing so very combustible a material as that it should retain the fire during this brief interval.

Moreover, if a small quantity of water were injected into a large mass of any combustible material fully on fire, the extinguishing power of the water would be overcome by the quantity and intensity of the heat, and the steam suddenly created would act with explosive force in scattering the burning materials all around. Just this we see on a small scale in a candle, when minute quantities of water in the wick, instead of putting out the flame, only produce a series of sputtering explosions. The explanation of the extinguishment of fire by water is the cooling effect of the water in reducing the temperature of the materials below the burning-point. This effect is due, it is true, not to the simple cooling power of the water as water, but to the enormous amount of heat absorbed by it in being converted into steam.

Of course, if the quantity of water thrown upon a fire is not sufficient to abstract from the fire, by its conversion into steam, heat enough to reduce the temperature of the whole mass of burning materials below the burning-point, it will not extinguish the fire.

The process of combustion consists essentially, in ordinary cases, in the combination of the combustible with oxygen by a chemical action intense enough to develop light and heat. Of course unless air is present, or some other supporter of combustion, this process can not go on. Now the Greek fire, so far as is now known, contained within itself no substance that could furnish oxygen, but was dependent altogether on a supply from without. It could not, therefore, continue to burn when the air was excluded. Nor could it possibly withstand the cooling effect of any large quantity of water applied directly to the burning mass.

The transition from the manufacture of Greek fire to that of gunpowder in war, it is now found, was not the result of any sudden discovery, but grew gradually out of the incidental introduction of saltpetre among the combustible substances, which was found in some mysterious way greatly to increase the violence of the combustion. Saltpetre is a substance which is found abundantly in a natural state in the countries where Greek fire was most used. The mode of its operation in changing combustion into explosion was not probably at first comprehended, as the science of chemistry was then practically unknown. It is now, however, understood that the result is due to the saltpetre's furnishing a supply of oxygen to the combustibles, and thus making them independent of the air in respect to their burning. It furnishes the supply, too, in such a way, to every particle of the combustible, by means of the

magazines like yours, you wonder what the hell is really going on. You make matters that much worst. Even bring out the worst in somebody. Why add fuel to the flame. You make matters much worst. Your real cure starts at the community not the media. Now I don't know who to believe or what to believe anymore. I wonder sometimes who's really running this country. Believe half of what you see and nothing that you hear. Or read for that matter. I was caught in one ■ your sting operations, through a magazne ad. It stinks. I've had no criminal record and don't say to your self well he just didn't get caught. Bullshit! You all planted the Ideal! Go find the real criminals and get out from that desk and computer. As for me I'm going back to my normal lifestyle citizen. I hope one day when I get older, Our generation will think more about the bible and follow its rules, More so then what our governments based on. "Remember", In God we Trust. Ha, Ha!, I hope one day you ■ will realize what's going on. Orwellian here we go!

Respectfully Lawrence ----

Now for my translation and/or commentary:

Dear Mr. Saxon:

I think your Poor Man's James Bond sucks! (He disapproves of the PMJB). And all the rest of the books you publish. (Either we lost his order or he ordered from someone else, so I don't know ■ he ever saw any of my other works). I know that you are an agent of the United States. (He thinks I'm a Federal agent). It's totally ridiculous the methods that you employ here. (The methods I employ to entrap his kind are ineffective). Were taught from very young about history, the government, constitution rights this and that. (We're taught, while young, history, civics, our Constitutional rights, etc.). We learned it all through reading! (By emphasizing reading, he reflects the tribalist's attitude that anything that can get into print is gospel and must be obeyed).

You read the papers everyday about crime, war, polatics, right! (He reads the news daily and is influenced by the negative aspects of life). So here you go around wondering about how bad things really are right. So now you got the blues (the news depresses him) and your wondering what to do. You pick up a magazine and read your advertizement, send for it and recieve it. (He read an advertisement for the PMJB, ordered and recieved it). Here you read all this nasty stuff, that was of course your ideal and ideals! I would have never guessed how to make this stuff if you havent furnish the information. (He orders a book on deadly force and blames me for putting ideas and ideals of violent behavior ■ his mind). It seems totally contrated what this country stands for. (Your ideas seem totally contrary to our national ideals). It seems you should practice what you preach! (I do, but I don't know if he means me or if the statement is rhetorical). I feel I lost my right to privacy. (Someone knows he now has the power of life and death over others so he will be watched from now on). Oh well, stick it in your computer. (If I had one, I'd know if he ordered from me). Your false and misleading advertizement-- (The PMJB is exactly as advertised. But to Lawrence, a practitioner of doublethink, the ad was indeed false and misleading. To the tribalist, all unorthodoxy --seems to break the law. The ad made him believe I was encouraging the implementation of his fantasies of illegal acts). When you read magazines like this you wonder what the hell is really going on. (When he, not I, reads such magazines, he realizes there are overtly unorthodox belief systems and wonders if they are contrived by Big Brother to entrap him). You make matters that much worst. (He would have gotten the world straightened out in time if I or the publishers of whatever magazine he refers to hadn't led him under the scrutiny of the authorities). Even bring out the worst in somebody. (He believes the magazine aroused his primitive instincts). Why add fuel to the flame. You make matters much worst. (Individual preparedness offends the authorities and makes the system more oppressive).

Your real cure starts at the community, not the media. (Any remedial action should be at the community level, by committee. Publishing unorthodox ideas encourages individual action, which is a threat to the collective). Now I don't know who to believe or what to believe any more. (To think for himself is unthinkable. The tribalist must have an authority figure to believe in or he feels abandoned). I wonder sometimes who's really running this country. (Who is my master?). Believe half of what you see and nothing that you hear. Or read for that matter. (Wear blinders and shut out all communications, lest an unorthodox idea creep in).

I was caught in one of your sting operations, through a magazine ad. It stinks. (A sting operation requires a willing dupe set up by one who helps him carry out an illegal act observed by the authorities, or a crook who means to run off with the loot, leaving him holding an empty bag. Since I have no connection with my readers there can be no sting involved). I've had no criminal record and dont say to your self well he just didn't get caught. (He's really a good boy). Bullshit! (Well, maybe not that good). You all planted the ideal! (But what ground was it planted in?). Go find the real criminals and get out from behind that desk and computer. (He really believes I'm THE MAN).

As for me I'm going back to my normal lifestyle citizen. I hope one day when I get

fine comminution and intimate commixture of the materials, as to present to every portion of the combustible a portion of oxygen close at hand, and thus increases enormously the rapidity and violence of the action.

There is another important thing to be borne in mind, which is, that a mixture of combustibles with saltpetre, by containing within itself the supply of oxygen necessary for the combustion, and thus making the process independent of the external air, allows of the inclosing of the materials in strong and tight receptacles, so that the gases produced by the combustion may be confined, and so made to exert their vast expansive force—enormously increased by the great heat developed—upon the walls of the receptacle which confines them.

The mode in which saltpetre thus operated in promoting rapidity of combustion was not probably at all understood in those days. It was observed, however, by many persons and in many different countries, as a matter of fact, that the admixture of saltpetre with their other pyrotechnic materials greatly increased the effect, until finally an explosive power was developed sufficient for the projection of missiles from the mouths of open tubes, and then artillery began to appear on the field of battle.

Thus the art of producing gunpowder for the purposes of war seems to have been a growth rather than an invention; and so it is not at all surprising that the origin of it has been attributed to many different men of many different nations. It is as impossible, as a distinguished French writer has said, to answer the question who invented gunpowder ■ to any who invented the *boat*.

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older. Our generation will think more about the bible and follow its rules. (He's going to conform and get right with his mother's god). More so than what our governments based on. "Remember," In God we Trust. Ha, Ha!, (He doesn't believe our government trusts in his mother's god any more than he did when he ordered the PMJB).

I hope one day you all will realize what's going on. Orwellian, here we go! (He believes Orwell's 1984 is near. If you've read "1984" you'll realize that the timid, wishy-washy tribalist Lawrence typifies was the mainstay of Big Brother's INGSOC).

Respectfully, Lawrence ——
(He really thinks I'm THE MAN

Lawrence's traumatic reaction to the PMJB reminds me of an incident ■ my boyhood. I was walking along the dirt road near my home outside Elmhurst, Illinois. With me was my dog, Dumbo. As we passed Clyde Webster's home, his little dog, Rags, came out of his house and commenced barking furiously at Dumbo. Dumbo took no notice, as Rags was a chained dog and, therefore, beneath contempt.

Standing on his hind legs, straining at the chain, Rags grew bolder in his insults. Dumbo plodded on, staring straight ahead. Infuriated ■ the larger dog's refusal to do battle Rags strained harder and the chain broke. Freedom! Now he would thrash his haughty foe.

But freedom was a heavier chain for Rags. Freedom brings responsibilities known even to dogs. Freedom meant he would have to back up his ■ onvictions with teeth. So, almost as if he were playing a role, Rags actually put his little tail between his legs and slunk into his house, hoping against hope that Dumbo wouldn't notice he was free.

Lawrence is free. He still has the book. But lest anyone take notice of his freedom, he's going to get right with God and try to hide the fact that ■ ever strained at his chain.

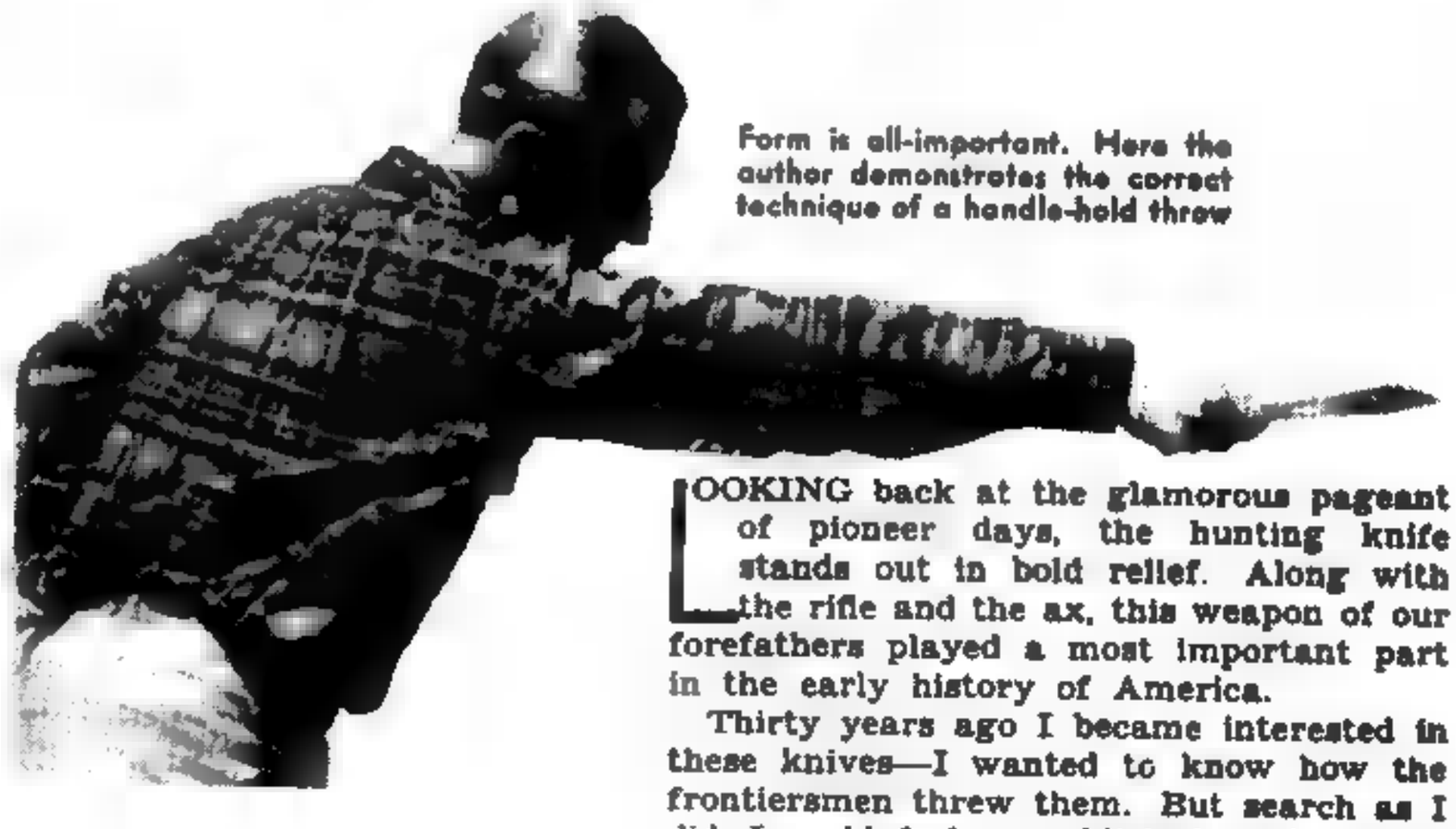
But in his mind, Big Brother is watching him and he will love Big Brother for the rest of his life.

Knife Throwing — for Fun & Self-Defense

It's merely advanced mumbletty-peg, but there's a practical side to this fascinating pastime

By F. C. NESS

OUTDOOR LIFE — DEC. 43



Form is all-important. Here the author demonstrates the correct technique of a handle-hold throw

Start of the power throw. The heavy knife is on its way back to a point behind the shoulder

LOOKING back at the glamorous pageant of pioneer days, the hunting knife stands out in bold relief. Along with the rifle and the ax, this weapon of our forefathers played a most important part in the early history of America.

Thirty years ago I became interested in these knives—I wanted to know how the frontiersmen threw them. But search as I did, I could find no published work on the subject; and I don't believe that any exists today. I had to learn my knife throwing by experiment.

Knife throwing is a fascinating pastime. Your arm swings back, steel flashes through the air—and *zip!* the blade quivers in the target. Properly thrown, the knife

hits hard and bites deep in businesslike fashion. Making the point stick nearly every time, and at various distances, requires a lot of practice; but practicing—on the trail, in camp, or at home—is fun.

There's a practical side to this exciting diversion, too. Porcupines and other small game have been impaled on the thrown hunting knives of hungry, lost campers. And skill with a heavy knife has doubtless saved more than one soldier's life. Signal Corps movies from the Solomons show our marines throwing knives on captured islands, and recent news photographs show our Raider and Ranger trainees practicing the art in groups.

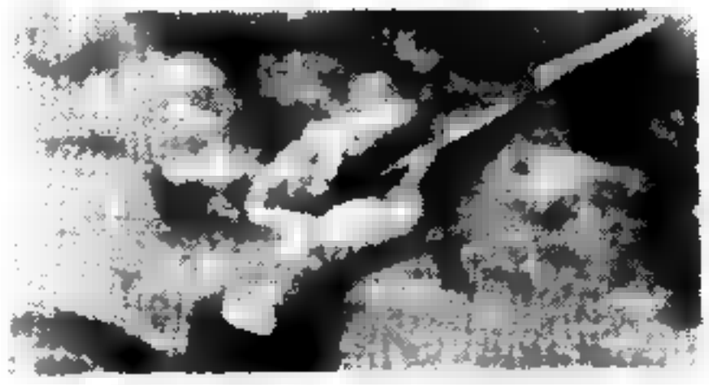
When practiced as a backyard pastime, knife throwing is merely advanced mumblety-peg, easily learned by anyone. Any light-handled knife—a kitchen knife, for example—can be used, and a heavy cardboard carton will serve admirably as a target.

Stand about three feet from the target, right foot forward. Hold the knife by the blade, point between thumb and forefinger,

Top of the power throw. Arm is all the way back, in position to hurl the knife forward and overhand in a mighty swing

Finish of the power throw. Arm fully extended, and pointed at target. Release is smooth and rhythmic

fist naturally closed, and flip it overhand from near the ear, straight at the target. If the knife does not land point first, move a step backward, and throw again. You are trying to find the distance — which the knife will make a half turn in the air and strike point on. When you have found it, practice a uniform delivery until you can make your knife stick every time.



For long power throws the knife is reversed, and finger extended along flat side of blade

Another variation of this throw has the index finger extended along the knife's safe edge

For slightly longer distances another grip is more effective. The blade is again held by thumb and forefinger, but this time the thumb is extended along the flat of the blade, and the knife is released with the thumb pointed directly at the target. This grip gives a slower half turn to the knife.

To throw from a distance of about ten feet, hold the knife flat in your palm, with the blade pointed toward your elbow, and your finger against the handle. Throw it overhand, and let it slide out, handle first, with your extended hand pointed squarely at the target.

Throwing knives. Top is a Victor Forge hunting type. Next, two Couteau Gene circus knives. And below, three of Victor Forge's throwing models

For distances of from twelve — fifteen feet, take the handle of the knife in your fist, extend your thumb, and let fly with the same short, overhand flip that you used for the blade holds. At about this distance, and with this throw, the knife makes a complete turn in the air.

These four throws are basic. Practice them until you have developed a smooth, rhythmic technique for each. It is useless to attempt long throws until the proper form has been mastered, and you can make the knife land point first at distances up to fifteen feet. When you can do that you will find that by doubling the range of the handle-hold throw, and trebling the range of the three other throws, your knife will again land point first.

While great skill can be developed through practice, knife throwing is not an exact science. No two persons throw precisely the same, and since the knife somersaults in the air, a beginner must find his proper ranges by trial and error. Form is the secret of success with knife throwing. You can use various throws for different distances, but the technique of a given throw must never vary.

My interest in knife throwing was stimulated some time back by a gift of a pair of beautifully balanced circus knives from Eugene Stebbings of Freeport, Ill. Eugene, better known as Couteau Gene, rode herd and followed a chuck wagon before he could raise a hair on his upper lip, and he is no slouch with gun or knife. At short range, with six of his knives in his left hand or in a hip quiver, he can stick them all in a six-inch circle, one by one, as easily and nearly as fast as he can shoot into the same circle with his revolver. Twelve years ago, he was designing and making knives for Tex Worl of the Ringling Brothers circus. The knives he gave me were a foot long, and weighed nine ounces. Forged from one piece of special steel, they were flat and thin, but perfectly tempered to withstand the abuse of hard throwing. The handles were straight, the edges of the blades dulled to permit the blade grasp.

The Couteau Gene knives are fine for accuracy. Like most throwing knives, they are balanced just forward of the handle, and their symmetrical shape contributes to a uniform delivery.

Missiles of this weight require a wooden target at least three feet square, and made of boards an inch or more thick. I made mine six feet high,

The first of four basic throws. The pinch hold on the blade of a light-handled knife

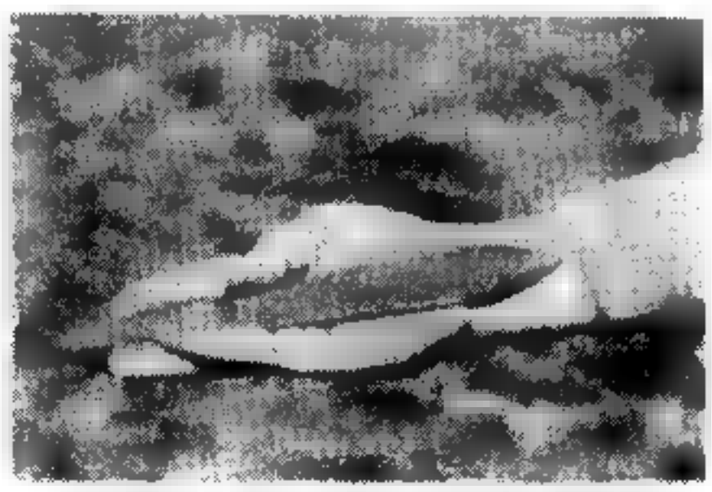
four feet wide, and used two-inch cypress planks. Before throwing, I soften the target with the hose and plenty of water. Also, while practicing, it is a good idea to hang a burlap bag containing excelsior, grass, or straw over

Second, the pinch hold with thumb extended. This gives a slower half turn to the knife

the target; for some of the knives are bound to land flat, and such a cushion will prevent snapped blades and split handles. Set the target behind the garage or some other high backstop, so as to keep your knives in your own backyard, and yourself out of a damage suit. A heavy knife is a formidable weapon in flight, so be sure that there is no chance of its hitting someone, even if it glances off the target. And don't throw, ever, at a living tree.

Just before the inexorable demands of the war stopped the manufacture of so many sportsmen's items, a new throwing knife, made by Victor Forge of Erie, Pa., appeared on the market. The four I own are nine inches long, and weigh 6½ ounces each. Made in one piece, like all good knives, they have short narrow handles and long spear-shaped blades. They are flat and dull edged, but balanced well forward of the handle. For pleasure throwing, particularly for handle holds, and for rapid-fire grouping, these knives are hard to beat.

I have other Victor Forge knives—hunting style, with a razor-sharp edge and a small projection or guard near the handle. But the balance is there, and except for the blade holds these



Third, the palm grasp for distances of about 10 ft. Here, knife slides out handle first

knives can be thrown exactly like my throwing models.

For self-defense, such a knife is held

Fourth, the handle hold with thumb extended. This throw is for distances of 12 to 15 ft.

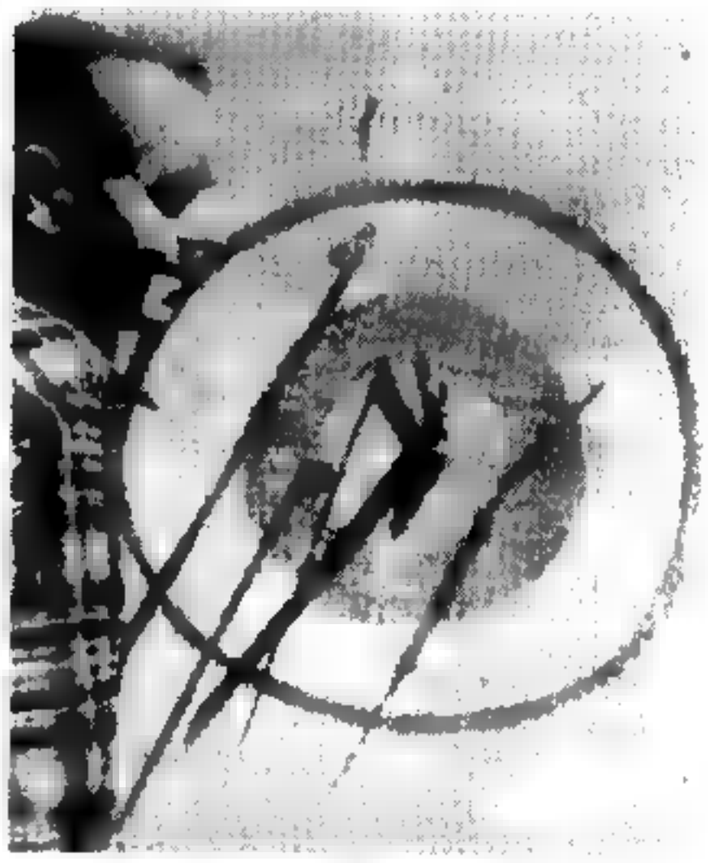
in the fist, with the blade inclined forward and the cutting edge up. In this position it ■ ready for belly ripping or sticking under the ribs from below the opponent's guard. It is also ready for throwing. And this ■ the very hold I use for short power throws. When thrown with my right hand, one of these knives makes a complete turn in the air and lands point first at about seventeen feet. Thrown with my left, it turns once and sticks at about twelve feet.

In all power throwing, and especially in combat work, the purpose is to hurl the knife with the greatest possible velocity. So stand with your *left* foot forward (instead of the right), extend your knife arm all the way back, and sweep it forward and overhand in a mighty swing. Get your weight behind it and, most important, follow through. The release is the same as in the other throws—a smooth rhythmic slide from the hand.

For serious combat practice, concentrate on this throw. Find the approximate distance at which your knife will make a complete turn, and practice until you can make it stick every time. Eventually you will be able to make your knife revolve once, twice, or even three times, and still land point first—with a thrilling, deep-biting thud.

For accuracy in the longer power throws, I reverse the knife, and extend my index finger along the flat of the blade, or along the safe edge. This gives the knife a slower turn, and makes it easier to strike a distant target point first. Using the short, twelve-ounce Enfield bayonet, I can drive its eight-inch blade deep into a target at thirty feet—which I consider the maximum distance for practical power throwing.

Once you have learned to make your knife land point first at various distances, you will be surprised at how closely you can gauge the range with your eye. You will want to hurl your knife into every sand pile, clay bank, dead tree, or stump. I know I do. Unconsciously, you'll pick out some likely-looking target, note the dwindling distance, and let fly when the range looks right. And nearly every time it will be.



By using the handle hold, with thumb extended, these knives were thrown from exactly 12 ft.

PIPE SHOOTS THROUGH ITS STEM

Popular Science Monthly — 1933

Though innocent enough in outward appearance, a novel type of firearm disguised as a smoking pipe serves as a formidable weapon when it is needed. The gun fires a .25 caliber cartridge. Its stem unscrews for loading, while the bowl of the pipe serves as a magazine for five extra rounds of ammunition. A knurled screw near the center serves as a trigger, and fires the pipe pistol when it is pulled back as illustrated in the photograph above, the user sighting meanwhile along the length of the stem. A German inventor is responsible for the unusual weapon.

The Wallet Pistol

By Kurt Saxon

The wallet pistol is about the best defensive weapon I've come across. An ex-cop who sold me mine said he'd been searched and it had been passed over.

There would be little reason to fear it being detected in your hip pocket. The only way anyone would know would be if you spread the word around and someone told the law you were carrying it.

If you should adopt the weapon you should make sure it projects a half inch or so out of your pocket. Otherwise, it will snag on the sides of your pocket and be hard to withdraw. Snagging is prevented by measuring the wallet and sewing the pocket across so the wallet won't go out of sight.

To use, wait until some dummy demands your wallet, then take it out and shoot him at least twice.

The gun shown here is a High Standard, .22 caliber magnum Derringer. It holds two shots and can be fired one after the other in rapid succession.

There are other .22 Derringers on the market holding regular .22 long rifle shells. Hollowpoint Stingers are just about as effective as the magnums and those Derringers are considerably smaller.

The wallet shown here was made by a custom leatherworker. If you have a friend in the business you can get it done professionally. Otherwise, you can pick up a wallet kit at any craft shop and do it yourself.

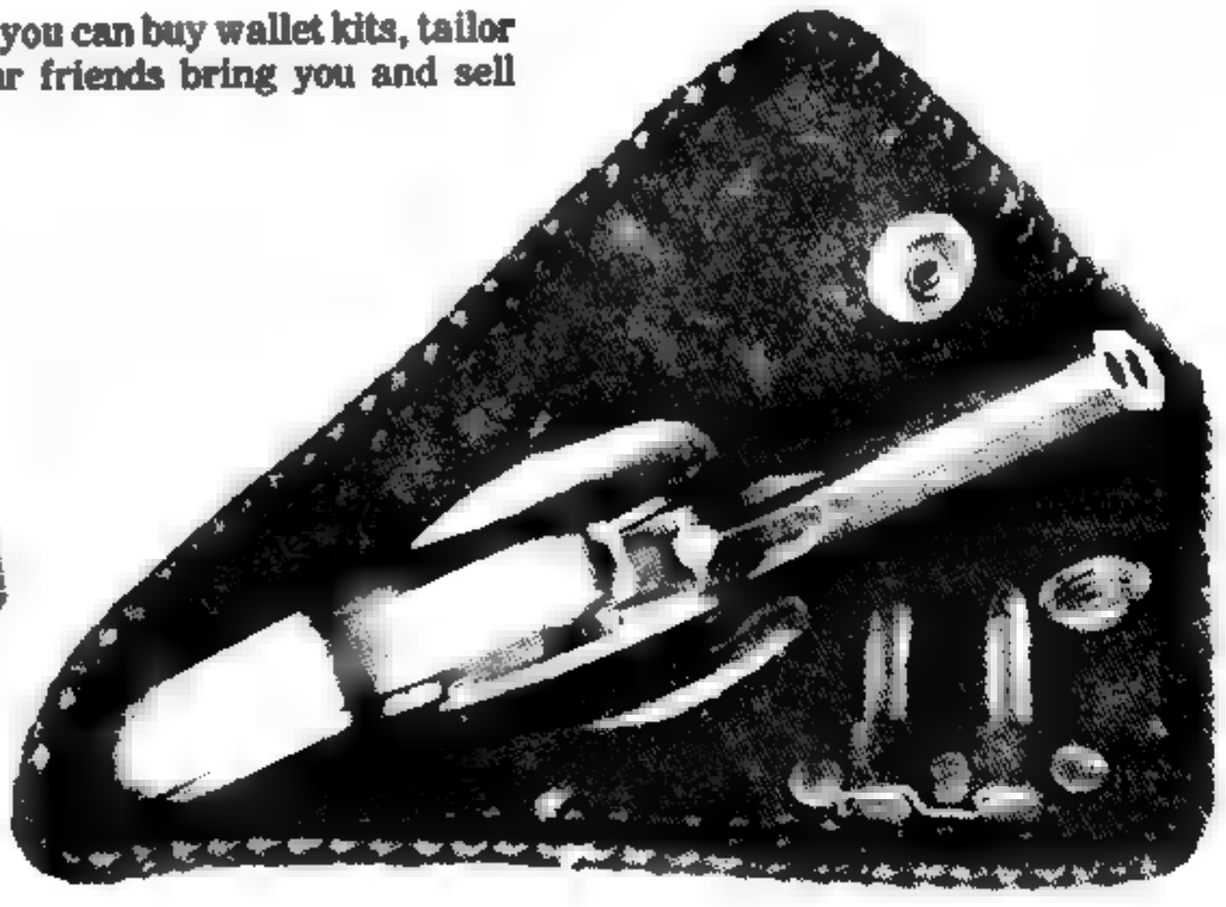
When you buy the wallet, discard the insides. Get a set of snaps from the hardware store and put one just under the barrel so it doesn't drift around inside. Lace or sew the top corner of the wallet shut to further hold the barrel.

Remove the grips from the pistol. Punch holes in the wallet over the holes where the grips are screwed on. Then just put the pistol in and screw the wallet tightly to the handle. The holder for extra bullets is optional.

With a razor knife, cut finger holes on both sides to reach through ■ the trigger.

To reload the pistol, just unsnap the wallet and swing the gun down.

If you are profit minded, you can buy wallet kits, tailor them to fit the pistols your friends bring you and sell them for $50.00 each.



The Versatile Hypodermic Needle

By Kurt Saxon

I suppose you've seen films of dopers shooting up with a hypodermic needle fitted to a medicine dropper. The impression was that the needle was precious and hard to come by. Forget the hypodermic. All dope paraphernalia was strictly underground and illegal.

Since I have several pets and have to go to the vet frequently, I took to asking for the used hypodermics and needles used on my animals. The vet handed them over and I thought I was really getting away with something. I had told him I wanted to use them for injecting chemicals in plants.

I would take them home and store the needles in a test tube full of rubbing alcohol to keep them from clogging up.

A while back I heard of a self-injecting device for diabetics who were too squeemish to jab themselves. I bought one from my pharmacist. It was no good since it only pushed in the needle but didn't work the plunger.

I had no intention of sticking myself and, without the double action I'd counted on, it was useless to me. But in the meantime, the pharmacist took it for granted that I was a diabetic and sold me some needles. They weren't the right size for the device but I had a lot of fun playing with them.

When the pharmacist asked me what kind [redacted] needles I normally used I told him I wasn't a diabetic; I just wanted them. He didn't blink an eye and sold me 100 3 cc diabetic hypodermic needles in separate packages at 17 cents each, or $17.00.

Like I've said before, when a person makes his living by selling something, he wants to make a sale, especially in these hard times. So if you don't have every appearance of being some kind of freak, all you've got to do is hand over the money and you've got the product.

Eventually, I intend to get several cases of various sized needles for barter later on. They will bring high prices from doctors who didn't stock up.

Of course, they are meant to be disposed of after one use. Many disposable hypodermics have the needles built in as opposed to those whose needles can be taken off. Either way, they can all be stored in alcohol after each use and so can be used hundreds of times.

Fine emory paper can be used to sharpen them occasionally. The dosage markings are usually on the inside and rub off with use. But the markings can be put on by hand on the outside with a small file by the doctor when the inside markings begin to dim.

A few cartons of hypodermics could set

Tylenol Interview

[redacted] KURT SAXON

The Tylenol murders gave rise to a classic example of mass hysteria. It should have been obvious from the beginning that the poisoning was restricted to a small area in Chicago and done by one sub-human. But it led to all the Tylenol in the country being yanked off the shelves.

Consider the average sub-human living in the anonymity of a city. He'll never be known for anything positive. But such a wimp wants to feel important, even in a negative way. He wants to [redacted] an effect, even if he's the only one who knows about it.

So [redacted] puts powdered castor beans in a hotel's air conditioning unit, causing Legionnaire's Disease, or puts razor blades in Halloweeners' apples or cyanide in Tylenol or acid [redacted] Visene or some other poison in Lavoris mouth wash.

The overreaction of the FDA, the news media and the manufacturers of the polluted products give the inferior a feeling of power and importance he could never otherwise achieve.

Instead of suppressing such stories until the sicko has been nabbed or the incident can be put in its proper perspective, the authorities and media run off in all directions, causing panic and loss with no more sense of social responsibility than the sub-human who started it all.

In the general grasping at straws, Chicago's own Roger Arnold was a suspect only because a fink said he had some potassium cyanide, (which he didn't) and some unregistered guns. A search turned up a copy of THE POOR MAN'S JAMES BOND, which has instructions for making potassium cyanide.

The media naturally publisized the PMJB, which was great for me. In their witch hunting spree, they also tried to shift society's responsibility for its degenerates to one who merely published a book telling how to defend oneself against those degenerates. Hence, the Democrat interview.

The Arkansas Democrat is the National Inquirer of the Ozarks. Incompetently staffed and poorly written, it caters to simpletons too dull of intellect and debased of ego to demand accuracy in newsgathering.

In 1980, Dan Wiseman, an effiminate nebbish, libelled me and killed the Democrat's chances of ever getting a straight story concerning my aims or views. When Margie Law phoned for an interview, I realized whatever I said would [redacted] distorted, exaggerated and/or taken out of context. So I gave her the most outrageous line of bull I could come up with. Many a truth is spoke in jest so I leave it to the reader to separate farce from seriousness.

The taped interview:

(Arkansas Democrat) "Hello, this is Margie Law of the Democrat. [redacted] this Kurt Saxon?" (Kurt Saxon) "Yes." (Dem.) "Have you heard of Roger Arnold, who works for the Jewel grocery store chain?" (KS) "Yes." (Dem.) "They found some books in his apartment that were written by you." (KS) "Oh yes, THE POOR MAN'S JAMES BOND." (Dem.) "Right." (KS) "Yes, that's a primer for killers. Anyone can murder anyone with that book. And I endorse it and I promote it. I think if you have THE POOR MAN'S JAMES BOND you can kill anyone you want. That's a great thing."

(Democrat) "Okay, you endorse it. You think [redacted] used that?" (KS) "I don't know but I think he could have. I don't know the man. I don't even know if he bought the book from me or one [redacted] my dealers." (Dem.) "Where are they distributed, Kurt?" (KS) "Well, people write for my free catalogue and send the money and I send the books. And I have dealers around the country." (Dem.) "In the Chicago area?" (KS) "No dealers in the Chicago area."

(Democrat) "So you don't know this guy personally." (KS) "Oh, no. I don't know my customers. I don't want anything to do with my customers. Especially those from Chicago

you up in the medical supply business and make you a hero, too.

Aside from eventual barter, the hypodermic needle can come in handy in many ways. You say your squirt gun leaks? Well arise and get yourself some hypodermic needles. They don't leak and shoot a powerful squirt several feet. You might think a hypo would give only one good squirt but up to 20 good squirts can be gotten from a 3 cc hypo.

You just point it ■ one or more targets and go bip, bip, bip, bip, with your little old thumb. Practice helps but a lot isn't necessary.

If your only purpose is to use the hypo as a squirter, it would be best to take a pliars and bend the needle back and forth to break it off. It isn't needed and you wouldn't want to accidentally stick yourself.

If it is to inject an unsuspecting enemy you'll want the diabetic needle as it is the thinnest and shortest. In the excitement of an altercation, your opponent would not notice he had been injected. One quick jab, a little scuffling, and he would drop dead.

The diabetic needle is also best for injecting an enemy's rump while he's sitting on a bar stool. If you should give him a hearty slap on the back he'd probably be distracted into not feeling it at all. If he did, it wouldn't hurt and he still might not suspect he'd been attacked.

A quick thrust and plunge into the rump of a walking or standing opponent would hardly be noticed, especially by passersby. Keep moving, anyway. You must be aware, however, that no more than 1 cc should be used for a lethal injection. The reason for this is that the victim will probably withdraw reflexively. Even so, the injection of only one half a cc is almost guaranteed to be fatal if you've done your homework. Practice on a pillow.

Since the diabetic needle is the smallest and sharpest, it is also the most fragile. That's why you must practice a straight thrust into the naked arm, throat or some part ■ the body covered with tight fitting material, like the rump. Otherwise the needle will bend. Even so, in the next issue I'll detail a device that insures a straight thrust, even through relatively thick material.

Lest you think carrying hypos around would be awkward and fear sticking yourself while ■ rests in your pocket, don't worry. Each hypo comes with a long, plastic cap, like a holster. The beauty of this cap is that all you have to do is stick a safety pin through its tip and

since it's a documented fact that came over the TV last night that there are seven million people in the Chicago area and six hundred thousand of them are disturbed. So that's nearly one out of ten dingbats in that city and I don't want to live there. And I wouldn't put it past any of them to do anything ■ any of the rest of them. So I'm not at all surprised.

"And, of course, THE POOR MAN'S JAMES BOND is primarily to wipe out the sub-human populations of the cities. So the more books I can sell to people in the cities, the happier I am about it." (Dem.) "So the purpose of your book is ■ wipe out the sub-human populations of the cities?" (KS) "Yes, that's right. That's the only legitimate purpose for such ■ book as that."

(Democrat) "Okay. But what do you mean by 'sub-human population'?" (KS) "Well, urbanites, as far as I'm concerned, are all sub-human. No one in his right mind would live ■ ■ city, anyway. I'm a rural type, see? I'm a hill person."

(Democrat) "Kurt, are you ■ Survivalist?" (KS) "I am THE Survivalist. I coined the term." (Dem.) "What does that mean?" (KS) "Well, a Survivalist is a person who realizes civilization is about ■ collapse and wants to get out from under it."

(Democrat) "Are you working on any other books?" (KS) "I'm working on THE WEAPONEER right now, which picks up where THE POOR MAN'S JAMES BOND leaves off. It tells how to make ricin, potassium cyanide grenades. The last issue told how to make cyanide smudge pots but there was a typographical error so I don't think my readers will understand it until I correct it next time."

(Democrat) "What did you think of the Tylenol murders?" (KS) "Well, that isn't really my way of doing things. I would have asked for money before I did anything like that. He didn't get any money out of it and people think he's a bad person now. So why be hated any more than you are otherwise if you're not being paid for it?"

(Democrat) "Kurt, he's just a suspect. They don't really know if he did it or not." (KS) "They'll never catch the one who did it." (Dem.) "Don't think so?" (KS) "Of course not. How could they? All you have to do, sweetheart, ■ to go into a store, buy some product, take it home, doctor it, take it back, put it back on the shelf, and how is anybody going to trace it to you?

What you ought to do is send the doctored product to the manufacturer and say, 'Listen, I'm going ■ put a dozen of these on the shelf if you don't send me some money, or put it in my bank account,' like that one extortioner did. But he didn't even do that. He just said, 'Put the money in my bank account or I'll start poisoning your product.' He ought to have sent a sample of the doctored product.

"For instance, say that you should buy a bottle of Head and Shoulders and empty ■ half out and fill it full of Nair and shake it up and send that to the manufacturer and say, 'You try it on a dog and after you see your bald dog, imagine what's going to happen if I put a dozen of these in The Elite Shop and get all these rich broads and they come out of the shower, just bald as an egg, and they're going to sue you out of existence, see?' So that way you could get money. But just to poison people or mess up their lives, willy-nilly, there's no profit to that."

(Democrat) "Do you know if he had any of your other books?" (KS) "I don't know. I hope he has because I like to sell as many as possible." (Dem.) "Do you keep records ■ people requesting your books?" (KS) "Well, there are records but I wouldn't bother ■ look it up because that's customer privacy. I wouldn't want people to have the idea that I'm going to turn their names over to the authorities just because they want to poison somebody."

(Democrat) "Would that book have been helpful in doing the cyanide poisoning of the Tylenol?" (KS) "No, it doesn't have any relation to how you use it. It just tells you how to make potassium cyanide. You have to determine how to use it yourself, because I'm all for letting a person think for himself. I'm not going to think for anybody. I'll tell you how to make it and then you decide whether you want to do it and how you want to apply the knowledge. I'm just a teacher."

(Democrat) "Have you been contacted by anyone else about this?" (KS) "Not any authorities or anyone like that. Mainly by people who want to buy THE POOR MAN'S JAMES BOND. I've been getting calls from all over the country and I suppose I've made quite a profit out of it. They say it's an ill wind that blows no good." (Dem.) "You've made a profit out of the story?" (KS) "Oh, I'm cleaning up. Besides, I didn't know those seven people,

pin it to the inside of your clothing.

One way is to put the cap down into one corner of your shirt pocket. Then stick the pin in through the back of the pocket in the inside of the shirt. Thrust the pin through the tip of the cap and back through the pocket and close it.

Now just stick the hypodermic's needle into the cap and you will have a weapon secured and safe until you need it. All you have to do is yank it out when needed and replace it when finished.

For the shirt pocket hypo, the 3 cc weapon should be only 1 cc full. This way, only a little of the hypo is exposed to view and no one will notice it or suspect it for what it is.

If you want a real arsenal, you can pin any amount to the inside of your jacket and just let them hang downward. The caps hold them securely, with no danger of them coming loose. They can have a full 3 cc load. Just make sure when yanking them out of their caps that you have the presence of mind to grasp them by the tube rather than the plunger.

Since the caps are impervious to anything washing or the cleaners can do to them, you might consider attaching them with thread and leaving them in your pockets or coats permanently.

Don't plan on filling a hypo and carrying it around for days. Although the cap keeps air from the needle, you don't want to take a chance on the contents congealing in the needle.

If you adopt this weapon, plan on emptying the contents back into their normal container every night. Then fill them with alcohol overnight and shoot it back out each morning before reloading. In this way, the needle should be free from any stoppage for as long as you want to use it.

A very practical use for hypos is for filling small-mouthed containers. There are seldom found funnels small enough for tiny containers and so the hypo is the most practical for this purpose.

Scientific American — July 27, 1861

American Rifled Muskets.

All the army rifled muskets which we have examined appear to have too light barrels. In this feature they resemble the Enfield rifle. We are aware that a certain length of rifle, with bayonet affixed, is necessary for charging and receiving charge; but an improvement may ■ effected without reducing the total length of rifle and bayonet combined. Take three inches from the length of barrel, and add the weight of metal that would thus be removed to the diameter of the barrel; this will increase its strength, insure more accuracy of aim, and enable the soldier to handle it more easily. The bayonet may be increased in length three inches without adding a single ounce to ■ weight; and by using the very best of metal its strength will not be diminished.

anyway.

"Then again, that's one in a million. So that's not bad odds. And they might have been the nearly one out of ten who were nuts."

(Democrat) "Well, thanks a lot, Kurt."

Extraordinary

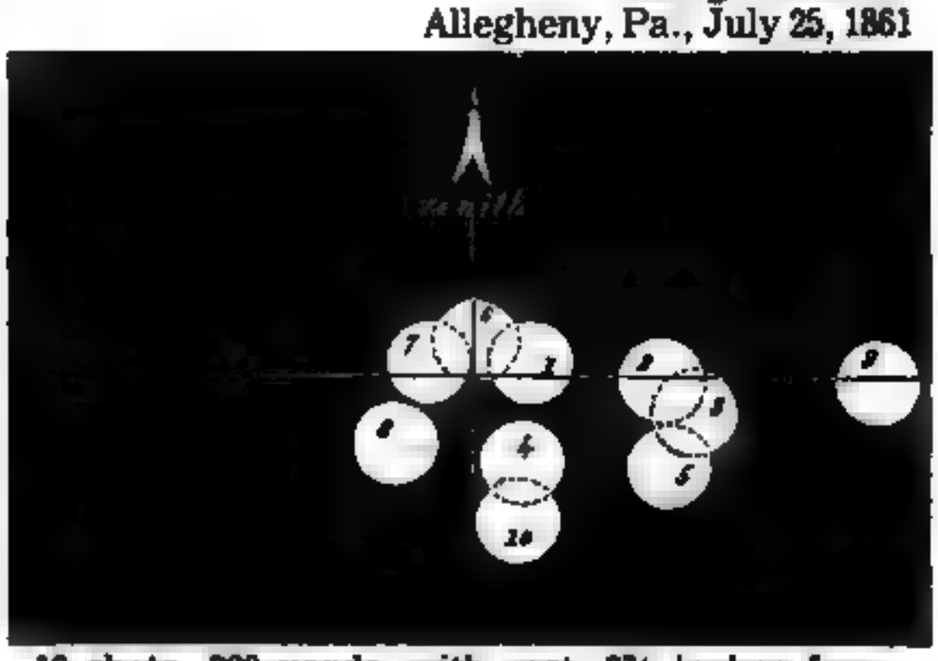
Rifle Shooting.

Messrs. Editors: — I send you a diagram of shooting made in this place on Wednesday, the 24th inst. Hearing of Berdan's great shooting, I thought I would send you a sample of "shooting as is shooting."

These shots were made precisely as drawn, and can be done again. ■ physically capable, I would join the regular corps of riflemen. ■ allowed to go upon my "own hook," under the government employ, I would do such services among the rebel officers as would save thousands of useful lives. I am a locomotive engineer, getting $2.50 a day, but I would throw up all, if I could do so satisfactorily.

Shooting men will appreciate the accuracy of the target I send you, and there are many here who would like ■ see it published. If of sufficient interest I would be pleased to have you do so. I would refer to my master mechanic for the reliability of.

Your obedient servant,
George N. Miller
Allegheny, Pa., July 25, 1861



10 shots, 200 yards, with rest. 8¾ inches from center of shots to the center of the target; or from edge of ball to center, an average of 3-5ths of an inch. — Rifle by James, of Utica, N.Y. — Shooting by Geo. N. Miller, of Allegheny City, Pa.

The Cyanide Smudge Pot

By KURT SAXON

For guarding the homestead, stopping traffic and attacking enemy installations, you can't beat the cyanide smudge pot. It is the simplest, cheapest, quietest and least destructive of property.

■ an armored column were approaching your holdings, why blow it up and waste so much good material? If marauders are sneaking around, why take any chances of getting shot? When attacking an enemy installation, why alert their personnel with gunfire?

The cyanide smudge pot is the poor man's neutron bomb. It's very simple and if you have the sense or the opportunity to use wind direction, you can not only protect yourself from any land attack, but can take your opponent's equipment with impunity.

Potassium or sodium cyanide can be purchased from many chemical companies rather cheaply and in bulk. If you don't care to buy it ready made you can make it yourself from easily gotten, less complex chemicals. Its simple manufacture is described on page 92 of THE POOR MAN'S JAMES BOND Vol. 1.

To make a cynide smudge pot, all you need is ■ tin can of whatever size seems suitable. Fill it half full of cyanide and place it where the wind will blow th egas toward the objective. Place it as close to the objective as possible without being detected.

To use, pour one part by volume of sulphuric acid into two parts of cyanide. Then get away fast. The gas will immediately billow up and flow downward.

Only a whiff or two is sufficient to kill any humans or animals in its path. After a few minutes to an hour, depending on windspeed, it will be safe to walk about the area, enter any structure or vehicle in the path of the gas.

Nest issue will feature cyanide hand grenades.

The Scientific American — Sept. 21, 1861

WHITE GUNPOWDER.

There is an article upon the above subject by M. Pohl, a German chemist, in the London, Edinburgh and Dublin *Philosophical Magazine* for July last, and another on the same subject in the *Chemical News*, Aug. 24th, by F. Hudson, Esq. Considerable attention has lately been given by some chemists to this peculiar substance. The former states that prussiate of potash 20 parts, sugar 23 and chlorate of potash 49 parts, make good white gunpowder. In exploding this powder, 100 parts of ■ yielded 47·44 of gaseous products and 52·56 solid residue. Ordinarily black gunpowder furnishes only 31·38 of gaseous products and 68·06 of solid residue. The efficiency of gunpowder is measured by the gases which are produced from it by explosion. An equal weight of white gunpowder will produce 1·67 times the explosive effect of the black. In order to obtain the same effect on projectiles and in mines, only 60 parts of white power will be required for 100 parts of the common kind. The residue of the white being as 31·53 to 68 of the black, it is more cleanly, while the heat generated when it is ignited ■ much lower; and a greater number of shots can be fired with it without heating a cannon.

M. Pohl considers that white gunpowder, being more energetic in its action than common black powder, it approaches more nearly gun-cotton for efficiency, and it has the advantage over this substance in being more easily prepared, keeping for a longer period of time without change, and is cheaper. This powder is not only easier of preparation than the old, but it may be made in a few hours in great quantities with very simple machinery. M. Pohl states that it is difficult of explosion by pressure and percussion; but Mr. F. Hudson, in his communication to the *Chemical News*, states that he made several samples according to M. Pohl's receipts and found that when he mixed the materials moist, then dried them at 150° Fah., the powder was very liable to explode with friction—it was indeed percussion powder. This was not the case when they were mixed dry. He says:—"A cannon loaded with white gunpowder goes off on the application of a few drops of sulphuric acid applied at the touch-hole. The property of this gunpowder may possibly be applied to some advantage in the preparation of bomb shells for long ranges. These shells would not explode until they strike the object, if filled with white powder, and contain a small glass vessel with sulphuric acid. No explosion of the shell would take place in the air, as is too often the case with the ordinary fuse shell."

As this white powder contains a very large amount of the chlorate of potash, it will corrode the locks and barrels of rifles more rapidly than common gunpowder. It, however, may be used as a good substitute, if saltpeter becomes scarce and high in price. It will also require to be handled with more care, as it is liable to explode with severe pressure. We have exploded it easily on an anvil by a blow with a hammer. As it is very cleanly we would prefer it to black powder, and ■ may yet be so manufactured, we believe, as to become a substitute for it, for most purposes.

The Scientific American — July 2, 1861

BLASTING BY ELECTRICITY.

The following illustrated description for conducting blasting operations by electricity is, in substance, taken from the Calcutta *Engineer's Journal*, and will be found very useful and interesting to many of our readers. ■ is best adapted for large blasts, as ■ would be rather expensive in comparison with the fuse, for common operations, such as blasting small rocks:—

PREPARATION OF CARTRIDGES.

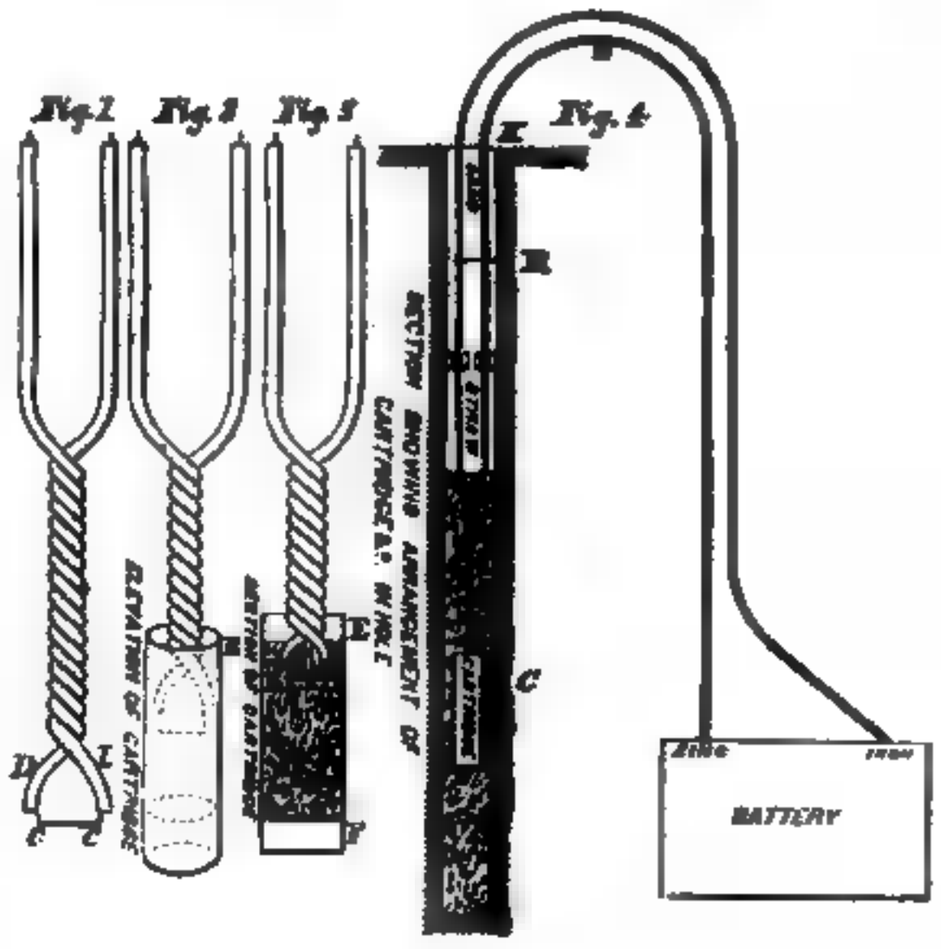
Take two copper wires covered with gutta-percha of the ordinary size employed to make the connections of telegraph instruments commonly called No. ■ gutta-percha wire. They may be of any length most convenient from 6 inches upwards. In the annexed drawing, Fig. 1, they are shown for convenience sake to be only about 6 inches in length, but it would be preferable to have them sufficiently long to project out of the hole a few inches above the surface of the ground, because then no fears need be entertained of any derangement to the connections made with the two battery wires to the two ends, A A, Fig. 1, during the process of filling in the hole, which derangement would injure the insulation and nullify the action of the battery. It should be observed here, that in cases where the shorter wires are used, it will be necessary, after making the connections with the battery wires, to cover the connections over with thin sheet gutta-percha (or paper would do, if the hole is perfectly dry) so as to insulate them perfectly from each other and from the earth. B B, Fig. 4, will illustrate the manner in which this is done.

Let the two wires first mentioned be twisted together for a length of about 3 inches, as shown in Fig. 1, care being taken to leave their lower extremities, C C, free for about an inch, separating them about half an inch from each other. Remove the gutta-percha covering for a length of about a quarter of an inch, as shown at, C C, Fig. 1, and brighten up the ends with sand paper, and then stretch across them a very fine iron, or better, platinum wire (also previously brightened up with sand paper), twisting ■ round the copper wires, and fixing ■ in the manner shown in the figure. The upper extremities of the two wires, A A, are also separated, and the gutta-percha stripped off for about an inch, for the purpose of connecting them to the two wires which are to proceed to the poles of the battery. If these connections, owing to the shortness of the wires, are to come within the hole, great care must be taken to insulate them from each other and from the earth in the manner already explained and shown at B B, Fig. 4. Fig. 2 shows the body of the cartridge, which consists of a tin tube 3 inches in length and three quarters of an inch in diameter, the joint being well soldered in

order that ■ may be impermeable to water. On introducing the wires into the tube they should be placed in the center, as shown in Fig. 2, and great care should be taken to prevent the two wires from touching the outside of the tube anywhere. To guard against this most effectually, the two ends should be opened out and then turned inward again, as at D D, Fig. 1, so that the gutta-percha shall press well against the sides of the tube; thus removing all possibility of the exposed ends of the wire coming into contact with it. The two wires are passed through a cork, and fitted firmly to the upper end of the tin tube, as shown at E E, Figs. 2 and 3, and made perfectly water tight by being covered over with a cement composed of two parts beeswax and one part resin. The tube ■ then filled with powder at its other extremity F, which ■ likewise stopped with a cork and cemented in the same manner. Fig. 2 shows the manner in which the cartridge is placed in the hole, after having carefully expelled all dust and moisture, great care being taken that the cartridge is situated in about the center of the charge of powder introduced into the hole, as shown at G, Fig. 4. Above the powder is placed a plug of straw, dry grass, or tow, shown at H, to allow, between the powder and the filling in, a small space filled with air, and above the plug dry sand is poured in until the hole is filled up to the surface, as shown at K. The two ends of the wire then, z I, which projects above the surface of the ground, are connected with the two poles of the battery by means of insulated conductors of sufficient length to allow of perfect protection from any dangers arising from the explosion. The greatest caution should be observed in not connecting the two wires with the battery until the moment the explosion is required to be made, as the effects are instantaneous. If necessary, a number of shots can be fired together, either simultaneously or in such rapid succession as to be all but simultaneous.

BATTERIES.

The battery best adpted for igniting the cartridges is Callan's battery, commonly called the "Maynooth

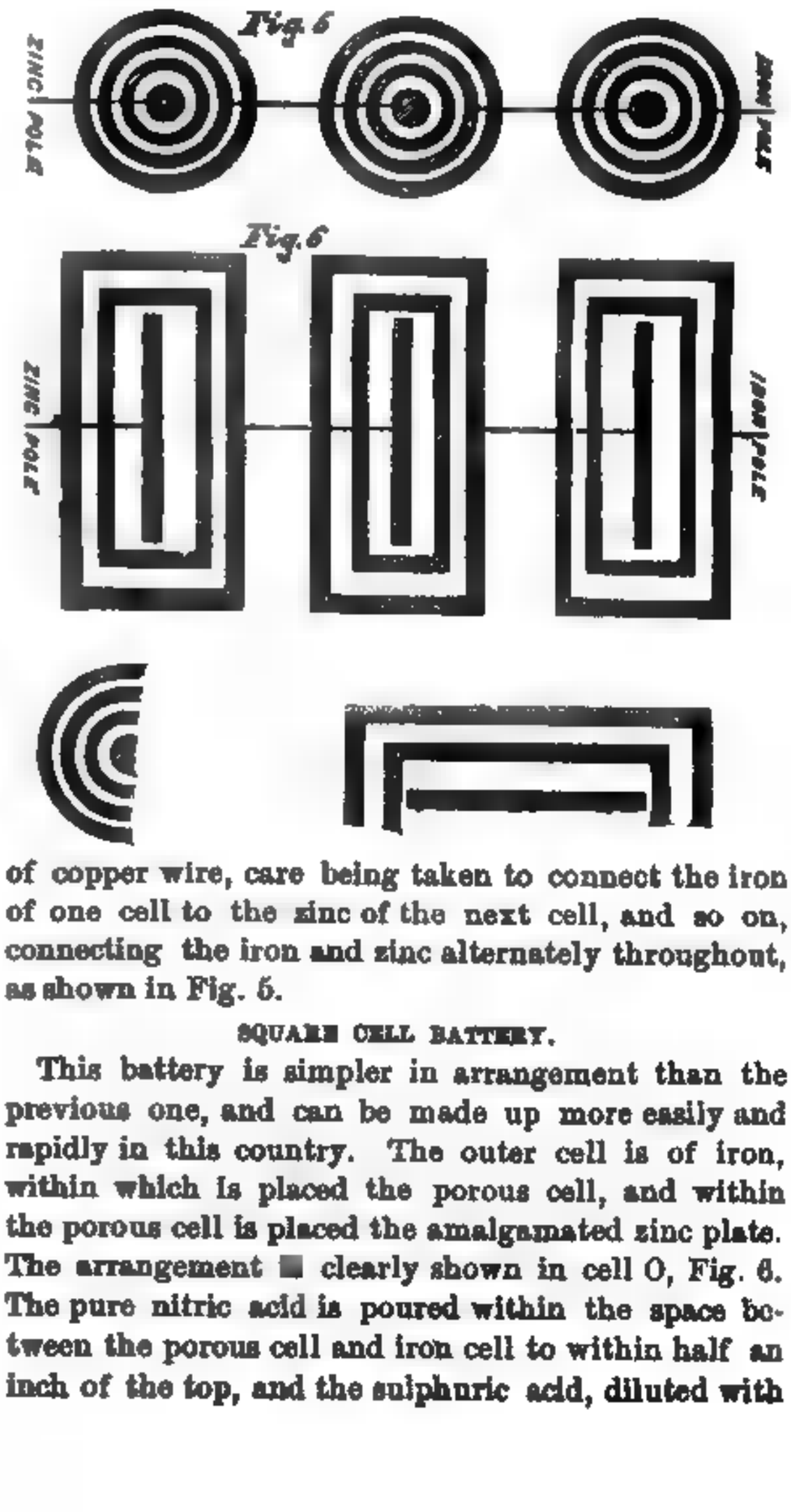


Battery." This is the simplest and cheapest form of battery, and can be most readily made up in India. It is very powerful, fifteen cells being sufficient for all purposes of ignition, or for conducting electrical experiments in general. Two forms of this battery are shown in Figs. ■ and 6, the one being circular and the other square. Three cells of each kind are only shown, as they are quite sufficient for illustration.

The number of cells required to make up a battery sufficiently powerful for firing a shot will be from fifteen to fifty, according to circumstances.

CIRCULAR CELL BATTERY.

The battery consists of, first, a circular earthenware cell; secondly, a circular iron plate; thirdly, a porous cell; and, fourthly, an amalgamated zinc ingot. These three last named are placed within the earthenware cell in the order above enumerated, and which will be seen more clearly by referring to cell M, Fig. 5. After placing them together, the space between the porous cell and the earthenware cell ■ filled up to within half an inch of the top with pure nitric acid, while the porous cell is filled up to within half an inch of the top with sulphuric acid diluted with water in the proportion of 1 of acid to 10 of water. The cells are connected together with a piece



of copper wire, care being taken to connect the iron of one cell to the zinc of the next cell, and so on, connecting the iron and zinc alternately throughout, as shown in Fig. 5.

SQUARE CELL BATTERY.

This battery is simpler in arrangement than the previous one, and can be made up more easily and rapidly in this country. The outer cell is of iron, within which is placed the porous cell, and within the porous cell is placed the amalgamated zinc plate. The arrangement ■ clearly shown in cell O, Fig. 6. The pure nitric acid is poured within the space between the porous cell and iron cell to within half an inch of the top, and the sulphuric acid, diluted with

water, as before, in the proportion of 1 of acid to 10 of water, is poured into the porous cell, filling it up to within half an inch of the top of the cell. The connections are made as before, the iron cell being connected with the zinc plate in the adjoining cell, and so on alternately throughout; great care should be taken to prevent the iron cells from touching each other, and it is necessary in arranging them to put a piece of brown pasteboard or wood between each. Ten of these cells are sufficient to ignite the cartridge, but the actual number to be used depends upon the circumstances and nature of the operations. Twenty cells of this battery have been found sufficient for producing the electrical light.

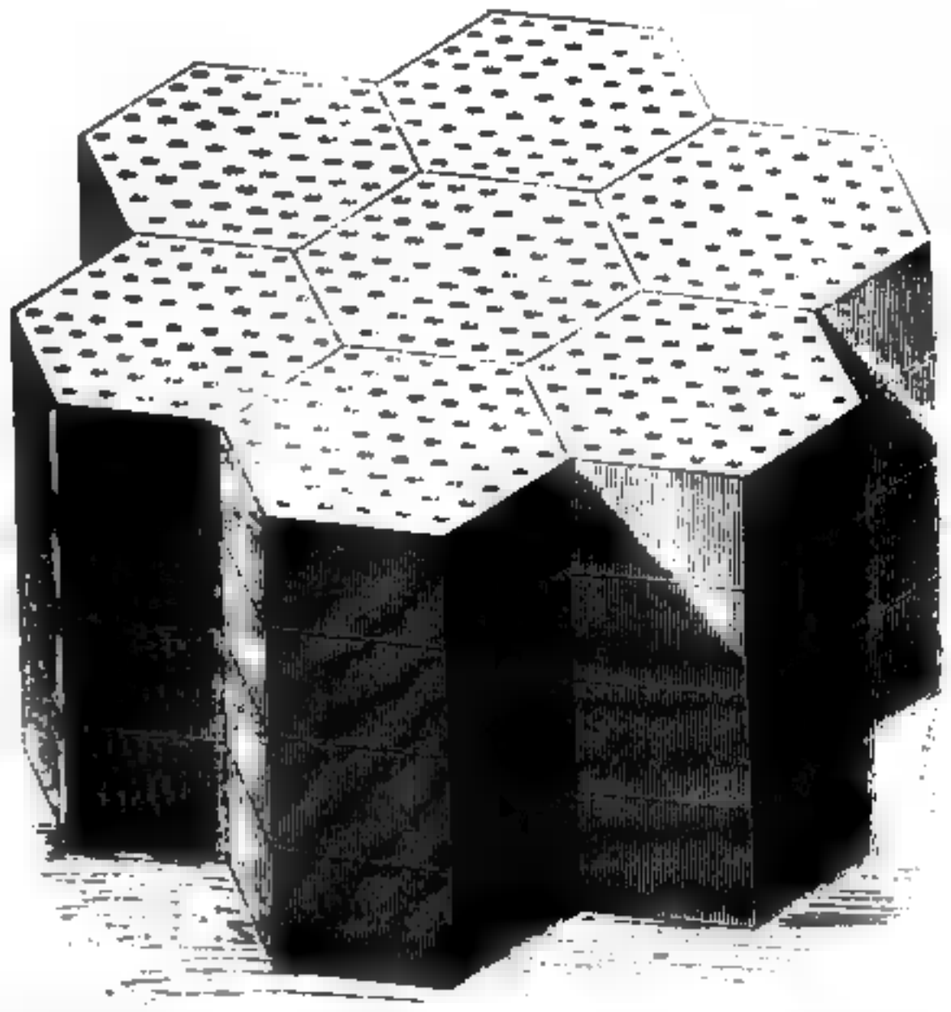
Mines may be sprung at a considerable distance away by the electric battery, as thus described. The Russians had the Malakoff and the Redan Towers all mined underneath, and filled with powder, in order to blow them up if the allies should storm them. They had wires connected with an electric battery at some distance off, but the Malakoff was saved from being blown up when the French entered, for a cannon ball had cut the electric cord, and the mine was thus rendered harmless. Part of the Redan was blown up, but no person was injured, as the English soldiers had been withdrawn almost as soon as they entered, as it was rightly suspected the fort had been mined.

Scientific American—July 27, 1861

RODMAN'S EXPERIMENTS WITH GUNPOWDER.

When ordinary small-grained powder is burned in a cannon, the combustion is so rapid, and the gases are consequently so quickly developed and so highly heated, that an enormous pressure is produced at the breech of the gun before the ball starts from its seat; then, as the gases expand, the pressure is rapidly reduced, so that the velocity of the ball is small in proportion to the maximum pressure exerted upon the gun. It occurred to Capt. T. J. Rodman, of the Ordnance Department, U. S. A., that if the powder were made to burn a little more slowly, the pressure would be less at the breech, and would follow up the ball with more force during its passage out of the gun, thus giving greater velocity to the shot with less danger of bursting the cannon.

The first plan that he tried for producing a slower combustion of the powder was to make it in large grains, which were compressed with great force, so that they could not be permeated by the gas, and, consequently, could burn only by a gradual combustion commencing on the outside and extending inward. Powder of the same quality in every respect, except the size of the grains, was prepared by the Messrs. Dupont, the grains in one sample being all three-tenths of an inch in size, those of another four-tenths, of another five-tenths, and of the last six-tenths. Capt. Rodman made a series of fires with this powder in a 11-inch gun, using the same weight of charge, 12 67-100 lbs., and the same cylindrical shot, weighing 183 3-10 lbs., at every fire. Five fires were made with powder of each size of grain, and the



mean results are exhibited in the following table:

Diameter of Grain.	Velocity of Shot.	Pressure of Gas, in Pounds, At bottom of bore	At 14 in.	At 28 in.
.6	933	21,370	10,350	8,030
.5	932	21,210	11,170	7,300
.4	881	25,590	10,750	7,300
.3	890	35,330	10,710	6,680

The smallest-grained powder, three-tenths of an inch in size, produced a pressure at the bottom of the bore of 35,000 lbs. to the square inch, which was reduced to 6,700 lbs. at 28 inches from the bottom of the bore, giving a velocity to the shot of only 890 feet per second. While the powder of largest grain, six-tenths of an inch in size, though producing a pressure of only 21,000 lbs, at the bottom of bore, followed it up with 8,000 lbs. at 28 inches, and gave a velocity to the shot of 933 feet per second.

The granular form, however, is not the best for cannon powder, whatever the size of the grains. In order to give the greatest possible velocity to the shot, with such degree of pressure as may be safely employed, the pressure against the shot should continue nearly uniform throughout its passage from the gun. It should be exactly uniform were it not for the fact that a less pressure will burst a gun if applied to its whole length than is required to burst it if applied to only a portion of its length; hence the pressure should diminish as the shot recedes from the breech, but not nearly as rapidly, as the experiments show that is does diminish even with the largest-grained powder.

As the shot starts very slowly at the breech, and moves with constantly accelerated velocity in its course through the bore, in order to make the pressure uniform throughout, the gases should be evolved from the burning powder with a corresponding acceleration. But, if the powder is granular, the combustion commences on the surface of the grains and proceeds inward, constantly reducing the size of the grains, and, consequently, the extent of the burning surface. Thus the rapidity with which the gases are

evolved is retarded instead of being accelerated. Capt. Rodman conceived that if the powder was formed into hollow cylinders to be fired wholly from the inside, the burning surface would be enlarged as the combustion progressed, and, consequently, the rapidity with which the gases were evolved would be accelerated. In order to confine the combustion to the interior of the cylinders, he molds them together into a cake, as represented in the cut.

The cakes are submitted to a powerful pressure in a cylinder, the plunger being armed with wires to form the holes. In practice, the axes of the cylindrical holes are parallel to that of the bore. The cakes are made from one to two inches in thickness, the cut representing four of them piled one upon another.

Capt. Rodman says that the increasing rapidity of the evolution of gas may be regulated so as to give any pressure desired along the bore, by establishing the proper relation between the number and diameter of the cylindrical holes, and the thickness of the walls between them.

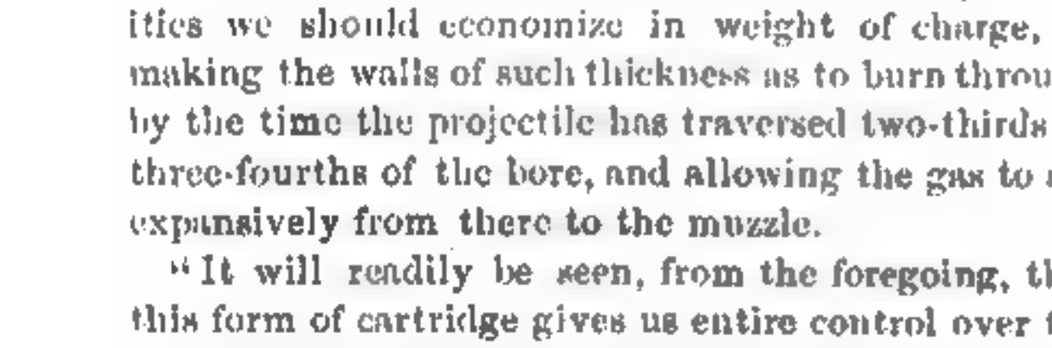
"The initial burning surface, and the ratio of the maximum to the mean pressure, may also be varied by varying the number and thickness of the cakes in a given weight of charge; the initial burning surface, and the maximum pressure both increasing with the number of cakes, since the burning surface extends over the whole surface of the cakes.

"The thickness of walls between the cylinders should be such as to be burned through, or consumed, before the projectile leaves the gun; and for ordinary velocities we should economize in weight of charge, by making the walls of such thickness as to burn through by the time the projectile has traversed two-thirds or three-fourths of the bore, and allowing the gas to act expansively from there to the muzzle.

"It will readily be seen, from the foregoing, that this form of cartridge gives us entire control over the rate of combustion of the charge, a fact the importance of which can hardly be overrated; for, taken in connection with the hollow mode of casting cannon, it removes all limit, as regards safety, to the caliber, of which even cast-iron guns may be made."

Ozark Bear Claws

■ faced with assault, especially by one



with a knife, two knives are always better than one. The Ozark Bear Claws are two knife handles with slits beside the blades to accommodate the blade of each into the handle of the other.

Closed, it just looks like an eight inch long by one inch thick piece of wood. It can be carried in the pocket and can be used as a yawara stick until you feel the need for more drastic measures. Then it becomes two razor-sharp knives held one in each hand and hard to argue with.

The wood components are six four inch long by one inch wide by 1/4 inch thick pieces. Three pieces go for each end. The four outside pieces are hollowed out 1/8th of an inch, leaving 1/4th of an inch of uncut wood around the three sides. One knife blade handle is epoxied into the top half of one and the bottom half of the other. then all the pieces are epoxied to make an unbreakable bond. Care must be used to hollow out the blade holding sections so they fit snugly. This is so they will hold together until purposely pulled apart.

Scientific American—Sept 7, 1861

A NEW MODE OF CONSTRUCTING CANNON.

BY J. C. BABCOCK, C. E., CHICAGO, ILL.

Notwithstanding the very satisfactory accomplishments of modern artillery, there yet remains a great opportunity for improvement in its efficiency. This branch of military science should receive a greater share of the attention of our scientific men, for if cannon are to be constructed doubly efficient to any now in use, we cannot, without imminent danger, shut our eyes to the fact.

Better field pieces are wanted, combining greater strength and lightness. Before any degree of perfection in both these requirements can be obtained, the following problem must be solved:—What method of construction will occasion the most equal distribution of the circumferential strain, throughout the

mass of metal?

No known material is capable of receiving a tensile strain without stretching. Cannon are subjected to two indirect tensile strains, circumferential and longitudinal. Now it has long been known (but not generally understood) that increasing the thickness of metal in a gun does not increase its circumferential strength beyond a certain point. This fact is easily proved and explained by the following experiment:— If we make equi-distant concentric lines on the end of a hollow cylinder of soft brass, Fig. 1, and impart an equal circumferential strain by means of a circular wedge driven into the bore, Fig. 2, we can at once observe how much more the inside is stretched than the outside, or even the intermediate spaces. The spaces between the lines will be seen to vary in width in direct proportion to the amount of strain on each, showing that while the inside space is strained almost to breaking, the intermediate spaces are much less strained, and the outer scarcely any at all.

Fig. 1

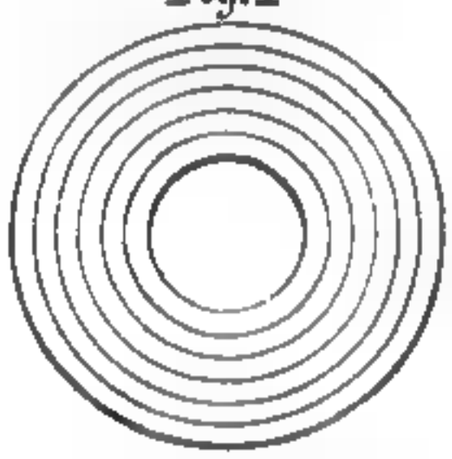
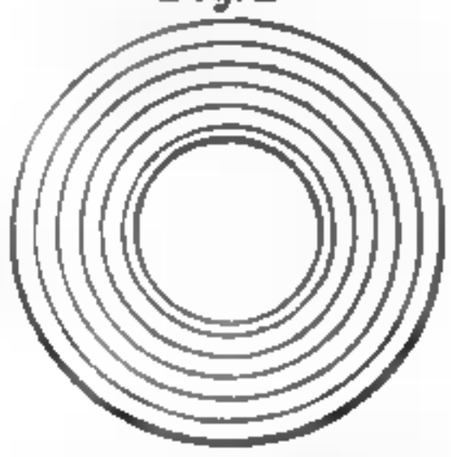
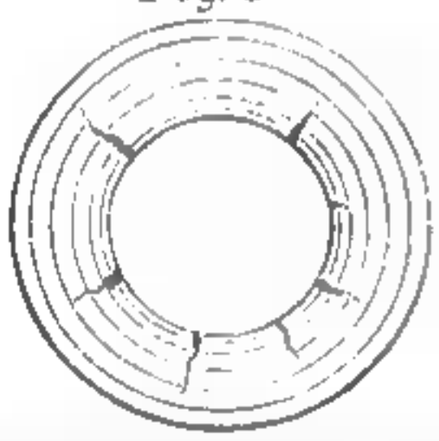


Fig. 2



Now if we increase the strain sufficiently to produce fracture, by driving the wedge still deeper, Fig. 3, it will be observed that the inner spaces will be completely severed, while the outer remains comparatively sound.

Fig. 3



The law has been found that in cylinders of metal, the circumferential strain on the different parts varies inversely as the squares of the distances of the parts from the axis. According to this ratio a two-inch gun with two inches of metal, will be internally fractured before the exterior receives one-twelfth part of the strain causing the fracture. Of course increasing the thickness still more would add very little to its strength.

The longitudinal strength has a direct bearing on the circumferential. The metal undergoing the opposite strains of compression and extension at the same time, is weakened in the former capacity in proportion to the strain in the latter, therefore increasing the longitudinal strength by adding thickness to the gun, increases its circumferential strength, but it only to a certain degree.

Longitudinal strain being uniform does not affect our ratio of the circumferential strain. Ordinary guns have a longitudinal strength twelve times greater than their circumferential, while the strain in the latter direction is eight times as great as in the former.

I think no better disposition of a solid mass of metal will ever be made than in the scientific proportions of the Dahlgren guns; yet what a pity to have so much of the material comparatively idle.

How then are we to equalize this immense circumferential strain which possesses the same ratio of inequality in all solid masses of metal?

A scientific arrangement of the material should be made whereby the several parts would take a moderate share of the strain, instead of the interior parts having too much and the exterior too little.

Numerous plans have been tried to accomplish the object, yet none have succeeded better than Armstrong or Whitworth. The wonderful accuracy and range of their guns is owing to the great velocity given to the shot which their method of construction alone renders possible. Their respective plans, although alike in principle, differ somewhat in execution. Their guns are built with concentric tubes or rings shrunk successively on each other with a gradual tension. The tension is increased from the interior to the exterior of the gun by a greater expansion in the heating of the different parts.

Another plan has been attempted to accomplish the same object by winding wire around a cylinder, increasing the tension each layer. Were there no longitudinal strain to contend against this plan would approach perfection; but it being necessary to braze the wire together in order to give the gun sufficient longitudinal strength, the heat required in the operation destroys the tension, rendering the gun at once inferior to one wrought in a solid mass.

Fig. 4

As has been said before, the longitudinal strain weakens the circumferential strength; this is a fact pertaining to all cannon that have yet been constructed. The idea has occurred to me, that in such a predominance of the longitudinal strength compared with the strain, that such an arrangement of material might be made whereby the longitudinal strain would assist, instead of weakening the circumferential strength. My plan for accomplishing so seeming an impossibility is as follows:—

On a cylinder of cast iron (the best material for the inside of a cannon) shrink a layer of wrought iron rings with moderate tension: these, with the cylinder should form about one-half of the thickness of the gun, Fig. 4. Bands of steel should now be wound spirally in alternate layers to the required thickness, reversing the winding each layer, Fig. 5. These bands should be wound while heated directly from a furnace prepared for the purpose, and the tension in-

creased on each layer in proportion to its distance from the bore, by regulating the heat.

Fig. 5

I am inclined to believe that this method of construction will make a stronger gun than has yet been produced. The longitudinal strain on the spiral windings, increases the tension at the moment of discharge when and where ■ is most needed, for no spiral can be extended longitudinally without diminishing in diameter. The arrangement of the materials in the order of their expansive properties, gives more work to the exterior of the gun, for cast iron is doubly more expansive than wrought iron, and wrought iron even doubly more expansive than steel.

The proper proportionment of the different materials in such a construction can only be obtained by experiment; when found, a gun must be made of immense strength and comparatively light.

An increase of strength in a cannon is an increase of its power and efficiency as an engine of war, especially when lightness ■ also combined. Modern ingenuity is advancing the perfection of the powder, bore and projectiles far more rapidly than the gun itself will permit of, and when cannon are made stronger and more scientifically, it will be time to turn our attention to the minor considerations of projectiles and breech-loading.

CYANIDE GRENADES

By KURT SAXON

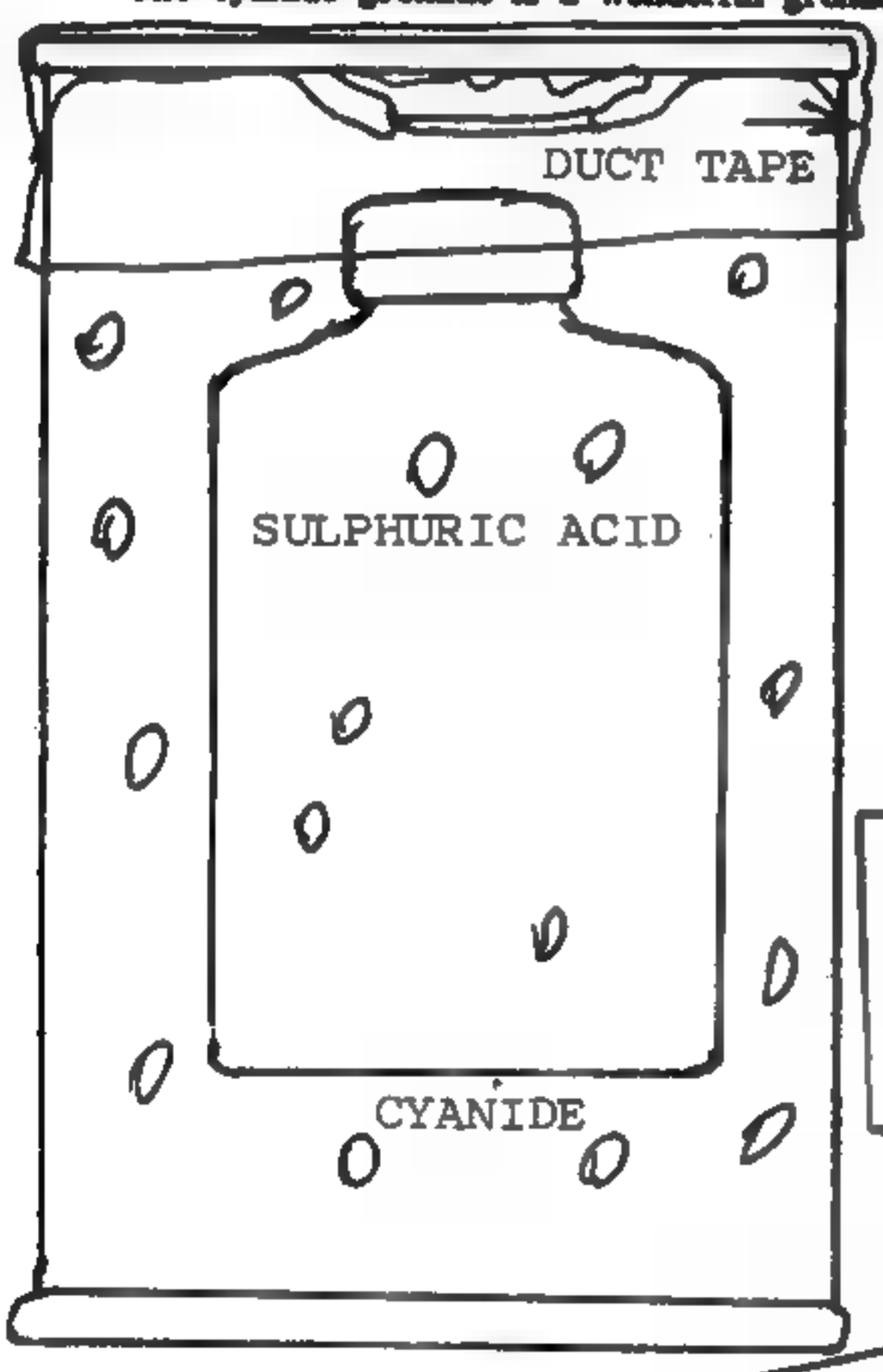
The cyanide grenade is a wonderful grenade. It is much better than the fragmentation grenade as it is not noisy. Nor does it destroy property or cause closed casket funerals.

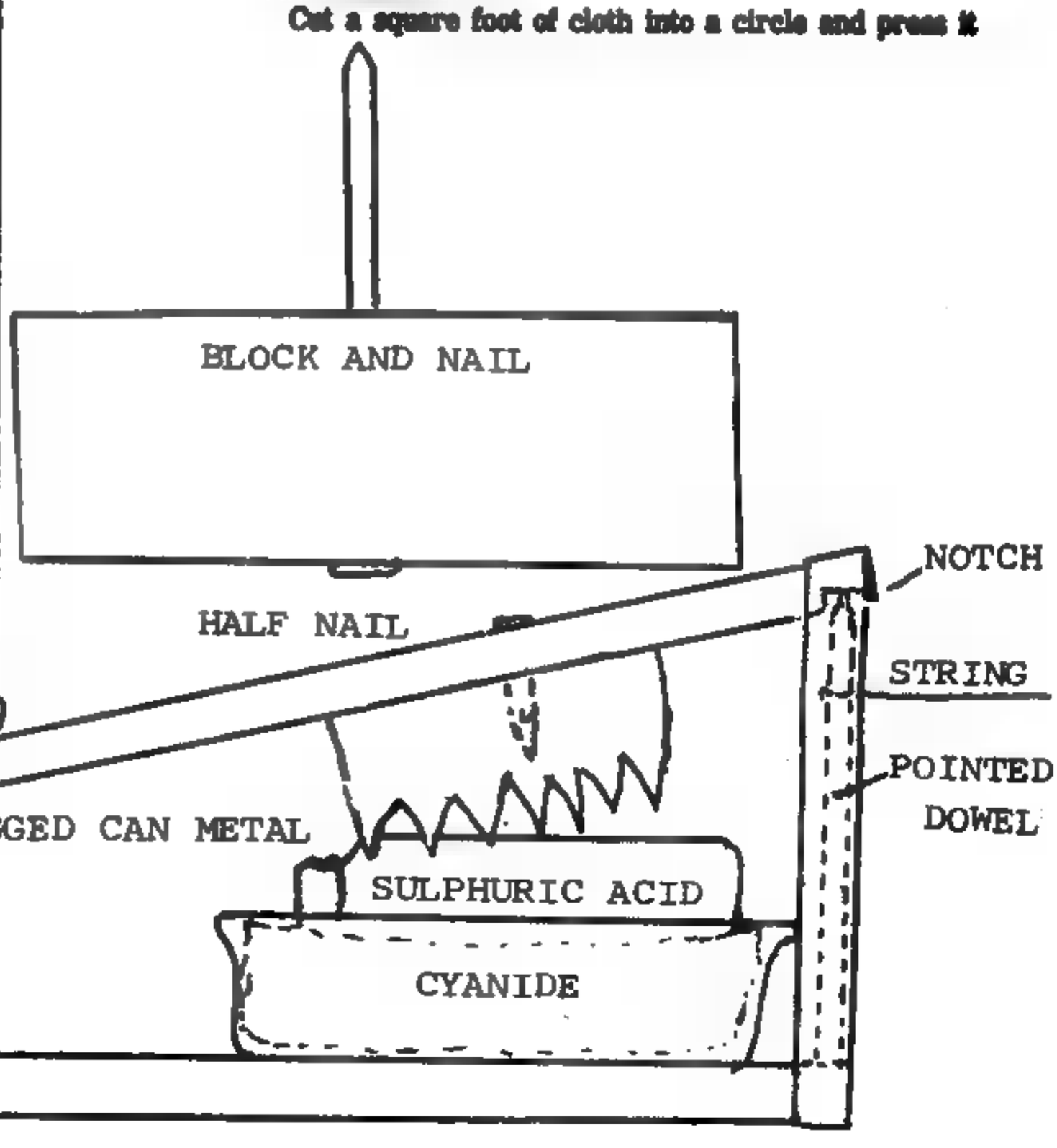
A modification of it is an excellent protector for the home when you are away. For cleaning out fag bars or enemy emplacements you can find no better weapon. It is easily made and costs next to nothing.

The materials are a 15 ounce tin can, with lid, one square foot of cotton cloth, duct tape, a four ounce glass bottle with a sturdy plastic top, sulphuric acid and cyanide. The igniter is a palmsized, one inch thick block of wood with a sturdy nail through it.

First, punch a dozen holes in the can with a sharp nail and a hammer.

Cut a square foot of cloth into a circle and press it





around the inside of the can with its edges protruding.

Put about an inch of cyanide into the can and put the bottle of sulphuric acid in the exact middle. Fill the can around and above the bottle with more cyanide.

Gather the cloth and tie it tightly with string or wire. Put on the can's lid and seal the grenade on top and around the top side with duct tape.

Cyanide attracts moisture so the grenade should be stored and carried in a sturdy plastic zip lock storage bag.

To use, remove from the bag and insert the nail into one of the holes near the middle of the bottle. Give the block a sharp smack with your palm to break the bottle and then toss it into the tomb of your choice.

To booby trap your home is easy. All you need is some wood, sulphuric acid, cyanide, dowel, inner tube rubber band and a plastic butter dish.

For the base, use a one foot long by one inch thick by three inches wide piece of wood. At one end, nail on two pieces of wood which have been drilled to hold a thin dowel. Drill a similar sized hole through the side of one end [redacted] another one foot strip of wood. Saw a piece out of the other end to form a notch.

Cut a large nail in half, sharpen it and bang it into the middle of the board about one-third of the way from the notched end.

Cut up a tin can and bend it so there is about an inch on one side of the bend and three inches on the other. Cut two three inch strips of this and cut a deep saw edge on each. Glue or tape the jagged strips about three inches apart on opposite sides of the nail.

Put a strong rubber band cut from an inner tube around the ends of both boards. Stretch it tightly and prop it up with a dowel pointed at the top end. Tie a string to the dowel and stretch it to a door knob or across a corridor or hall where an intruder would be bound to walk into it.

Before leaving your home or office, put a plastic butter dish or like container under the nail. Put a plastic bag with several ounces of cyanide in the dish. Next, put a four ounce bottle of sulphuric acid on the cyanide under the nail.

When an intruder comes in contact with the string, the dowel will be pulled out and the board will slam down. The nail will break the bottle and the jagged tin will shred the plastic bag. The acid will flood the cyanide and in seconds the area will be filled with deadly gas.

The gas dissipates in a couple of hours. Ideally, you should place the trap so you can at least see the taut string when you open the door. If it isn't taut you should hold your breath and go in and open some windows and get out before breathing. At the same time, turn on a fan or air conditioner if you have one.

Shut the door and return in a couple of hours. By then, it should be safe, even if it happened only shortly before you returned.

Go back in and examine the body. Take any money or valuables for your trouble. Dismantle and hide the trap. Open and rummage through some drawers to make the place look like a burglary was in progress.

Call the police and tell them a burglar got in and died of a heart attack or something. There is little chance a thorough autopsy would be conducted and even so, you were out and he had no business there and what could they prove? If it is night and there are no witnesses outside you can dump the vermin in the nearest alley and forget it.

Scientific American—Sept. 1861

What Guns Are Best.

It is no doubt the desire of every army and nation to possess the best implements of war, but great uncertainty prevails as to which are the most efficient. The principles of operation and the principles of mechanical construction embraced in the variety of weapons now brought before the public, are so different, and the opinions are so numerous respecting their merits, that it is very difficult to arrive at proper conclusions respecting them. A few words on this subject, to bring the matter intelligently before those in authority and the public, may be of some service.

Rifled cannon are now held to be the most efficient for artillery purposes. Their aim is more accurate and their range much greater than the old smooth-bored cannon, hence they are most destructive. [redacted] now seems to be the object of military authorities everywhere to bring them into general use, and [redacted] one army is provided with rifled cannon, its adversary must obtain similar guns or fight at a great disadvantage. For close engagements smooth-bored cannon must always be employed for firing grape and canister ; therefore, although rifled cannon are the most effective at long ranges, smooth-bored guns must form a large portion of the effective artillery belonging to an army for action at close quarters.

There are two special classes of rifled cannon, respecting which there are divided opinions among military men and others. The one has a movable breech and is loaded at the rear ; the other has a close cylinder behind, and is loaded at the muzzle. It is claimed for the breech-loaders that they can be loaded with less labor, are more convenient for receiving shot and shells, and that expanding shot are not required for them. The objections to them are, that they are more complicated and expensive in construction than muzzle-loaders, and they are more liable to get injured and become inoperative in action.

The greater simplicity of muzzle-loading cannon is admitted, but either winged shot or expanding shot is required for them. If muzzle-loading rifled cannon are equally as good as breech-loaders, all the sound old smooth-bored guns in our arsenals, forts and navy yards can be converted into serviceable and efficient rifled guns by simply grooving their insides, and this can be effected at a very small expense. This is, therefore, the important subject for consideration, as it now divides the opinions of very able military authorities.

The English and the Prussian governments have given their countenance to the adoption of breech-loading rifled cannon, and the Belgian government has recently proposed to expend about $8,000,000 for the re-construction of its artillery, adopting the Prussian screw-breech guns, which are said to be less dangerous in loading, more accurate in aim, and easier loaded than those which are charged at the muzzle. On the other hand, the French, Russian, Dutch and

Swedish governments have adopted muzzle-loading rifled cannon, the Hollanders having converted a number of their old worn-out pieces into good rifled guns by a process which exhibits genuine economy and considerable ingenuity. In the arsenals of Ho land there were a number of six-pounder bronze gur which had become so defective by use that they were condemned to be re-melted and re-cast. A happy thought struck one of the engineers. He proposed to clean out the bores and partially fill them in with a re-casting of bronze metal and then rifle them. This suggestion was carried out, and the old six-pounder defective smooth-bored cannon have been converted into rifled guns. By this simple process the Dutch have obtained from their old condemned bronze guns as efficient light field pieces as those ■ France and Russia, at the expense of only seven dollars for each.

Those who have advocated the muzzle-loaders and condemned those which are charged at the rear, say that the latter have been tried and condemned long ago—that they were the earliest class of guns made, therefore they should not receive that attention which is now bestowed upon them. Such a charge as this should receive but little consideration, for revolving firearms were really among the most early that were tried, and in the Tower of London there is a firearm nearly two hundred years old, which has a revolving charge chamber operated on the same principle as the most approved modern revolvers; and yet such weapons became lost to the public until revived by the improved Colt pistol.

Every firearm should be judged upon a consideration of its own merits, after repeated trials, and not by the prejudices and interests of any man or party. This is the only way to arrive at right conclusions respecting the merits of any piece of mechanism.

Having paid considerable attention to various kinds of guns, we believe that every sound gun in our country may be converted, at a trifling expense, into a good and efficient rifled cannon by the simple operation of rifling. We consider it folly to expend large sums in obtaining new rifled cannon while old ones can be rendered nearly as good as the best that are made from new materials.

The public has read accounts of the Sawyer, and James and the Hotchkiss cannon, but the guns which have received such names are common rifled cannon. The names of the inventors of the peculiar shot which were fired with rifled cannon, have been transferred to the guns by correspondents of papers unacquainted with the inventions.

In the construction of new rifled cannon for loading at the muzzle, we believe it will be found advantageous to employ a screw-breech piece, to remain fixed in firing, but which, if a shot should get fast in loading, may be removed for the purpose of getting out the charge easily. This method of making muzzle-loading cannon would be an improvement, we believe, and the same principles of construction may also be applied with advantage to small arms.

THE GAROTTE

By GENTLE BEN

The garotte has been made obsolete by weapons such as the silenced pistol. It's one advantage ■ that, with luck, you'll leave no blood behind. But your opponent will often defecate. However, sometimes you have to make do with what you have. And ■ is the macho assassination method. Mafia types are still terrified by that sort of hit. Practice it with a friend, in slow motion, a few times. You'll get very good at it if you have the mentality.

One of the best garottes you can have is a leather bootlace. Wrap the ends around your hands, holding the ends in your palms. Always approach your opponent from behind, preferably unaware. Try to always pick on someone weaker than yourself.

Either loop the lace over his head, or loop it before you place it over his head, whichever is quickest and easiest. That will depend on you and the type of garotte you use. Pull down and slightly to the side to tighten the garotte. Yank as hard as you can. Try to break his neck. Although you probably won't kill him by breaking his neck, even a minor dislocation will weaken him so he can't fight back effectively.

Of course, if the idea is to capture the victim alive, be a little gentler. As you pull the garotte, bend down on your knees, dragging him down on his rear. Be sure your knees are completely bent, to protect yourself from back elbow strikes. Your balance is better if you sit on the heel of one foot and keep the other foot flat.

You are now in a tight, guarded position and he ■ ■ an awkward one. Keep the pressure on and hang on like a bulldog. There are many things he can do to you at this point. But if you are tough enough, they shouldn't be too effective.

The garotte doesn't kill by strangulation. It cuts off the flow of blood to his brain. In about five seconds he should be noticably weaker. In about ten seconds he should be unconscious or in a helpless, semi-conscious state. As anyone who has been the victim of a sleeper hold can tell you, it is a painless death.

Another style ■ the tall man method. This should be used only on people your height or taller. It gives you a much better chance of breaking his neck. Its disadvantages are: you leave yourself vulnerable to back elbow strikes; you turn your back on your opponent, and there ■ an effective counter, which I'll explain further along.

You hold the garotte in the same manner as before. However, you don't loop the garotte over your opponent's head. Once you place it over his head, you turn around. This automatically twists the garotte. You then bend over and jerk the garotte as hard as you can.

If you are attacked in the tall man manner, try a back elbow strike, before he tries to jerk your head off. Get a hand between your throat and the lace. If you fail in that, or fail to react in time, roll with his force and do a backward somersault over him (not as hard as you might think, considering you have his back to do it on). With any luck, your neck won't get kinked up enough to keep you from fighting back. Anyway, you'll be pretty well off for someone dumb, trusting or naive enough to allow a deadly enemy ■ get so close, unnoticed.

The piano wire garotte has the advantage in that it is less likely to be seen going over your opponent's head, and it tends to cut his hands if he tries to interfere. Its disadvantages are that it tends to leave blood behind, and

if poorly made, it tends to snarl (at the wrong time it can be quite embarrassing).

To my knowledge, the stories of cutting a man's head off with it are a bunch of bull. The man who taught me most of what I know of garottes tried three different times and failed to take the head off. He was a resistance fighter in Rumania during WW II. Now a Green Beret. Contrary to the war stories you've heard, he was one of the few military men ever to use the garotte. He was fairly strong. If your intentions are to cut your opponent's throat, I suggest you use a knife.

A sturdy snake catcher, such as one made out of pipe with the twine running inside, is a very good garotte. Be sure to pull your opponent backwards and move him to keep him from turning around. Very difficult to break his neck with this garotte.

The sleeper hold is a way to garotte without a garotte. Place one wrist on your opponent's throat, one on the back of his neck. Lock your hands on your elbows and squeeze. Pull him down in the basic garotte style.

READY KILL-A-WATT

By "THE MAD DUTCHMAN & DOC ROSCOE"

If you've ever been shocked, you know how dangerous electricity can be. Most of us assume, when considering the lethality of electricity, that higher voltages are deadlier. 'Taint necessarily so! What kills is current (amps), not voltage. As you can see from figure 1, the

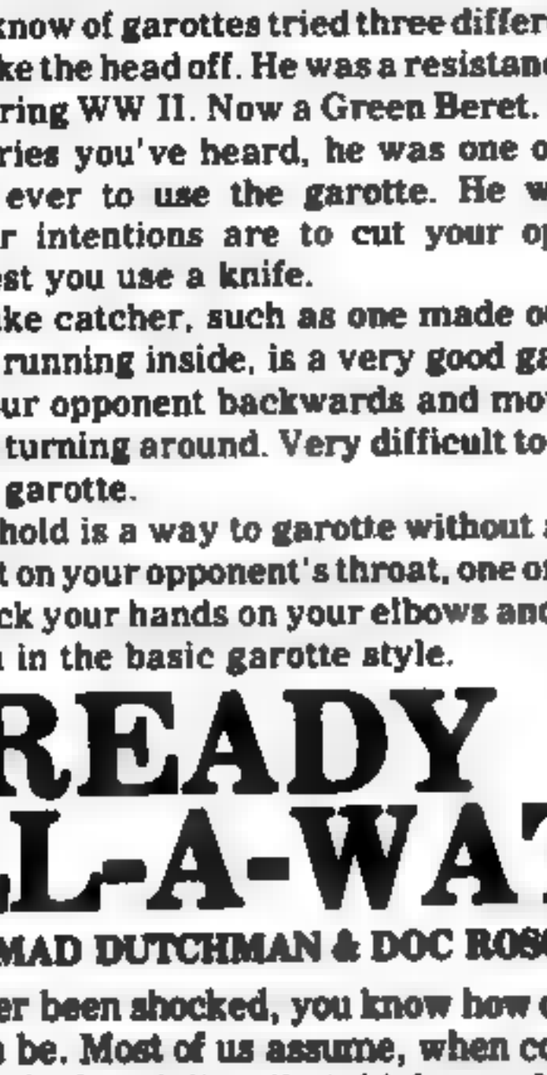


Fig. 1 Effects of electric current

lethal range is between 0.1 and 0.2 amps. To deliver this dose, a voltage from 50 to 10,000 volts is necessary. Factors that influence the voltage required are the resistance of the victim's skin, which can range from 1000 to 50,000 ohms; the weight of the victim; where the current is applied; and the person's biological resistance to shock (weak heart, etc.)

The current delivered is derived from the formula:

amps = volts / resistance

To be most effective, the voltage should be applied so it will be across the heart; for example, from one arm to the other. Remember, it doesn't help if the victim touches a high voltage source while insulated from the ground by rubber sole shoes or similar protective gear. Take these considerations into account when planning your defense system.

The best voltage to use is approximately 600 volts. Happily, this can be obtained from an old TV transformers' high voltage taps. (Most late model sets don't have them, so find an oldie.) If you don't know what a TV transformer looks like, get one from a friendly neighborhood TV repairman. (Most repairmen have LOTS of old sets, and will be glad to sell you a transformer.) Once you have a transformer, you will notice many wires sticking from it. One set is to be connected to wall current (110 vac). One of the other pairs is the high voltage set. To find the right pair, ask the repairman or a friend who knows about electronics. Their location is a trial and error process which requires a VOM and a low voltage AC source. This can be deadly if you don't know what you're doing.

If you don't want to fool with a transformer, you can use 220 or even 110 AC wall current. Many medium-sized portable gas generators put out 220 as well as 110. 220 is normally used in dryers and ranges. Its plug is about twice the size of anormal wall socket, and resembles figure 2.

Fig. 2 Typical 220 outlet

Once you have procured your voltage source, you must implement it in such a way that the victim is in extended and intimate contact with it, while at the same time not allowing the voltage source to be shorted out to ground. There also must be some provision of a fuse or circuit breaker so that once the victim is electrocuted, the current will not flow until the generator burns-out or the wiring overheats. If you ever have to attack a place protected by electric fences, you can defeat them by using a piece of metal to ground out the fence. Just don't electrocute yourself in the process. This technique will also probably alert any defenders.

Some suggestions on applications; soup-up a cattle fence. Electric fences are best against a sneak, night attack. Supplies for building an electric fence can be obtained from the Sears Farm Catalog. Another idea is to replace your doormat with a piece of heavy wire mesh and wire the other side of the voltage source to the doorknob. (Gets rid of bothersome salesmen, too!) Any sort of metal fitting, railings, etc. can be wired as long as is properly insulated from ground. The ultimate would be a ladder with metal rails (wired to the power source) and wooden rungs. Even a car can be wired up similarly. Almost any metal fitting can become a deathtrap. Good luck!

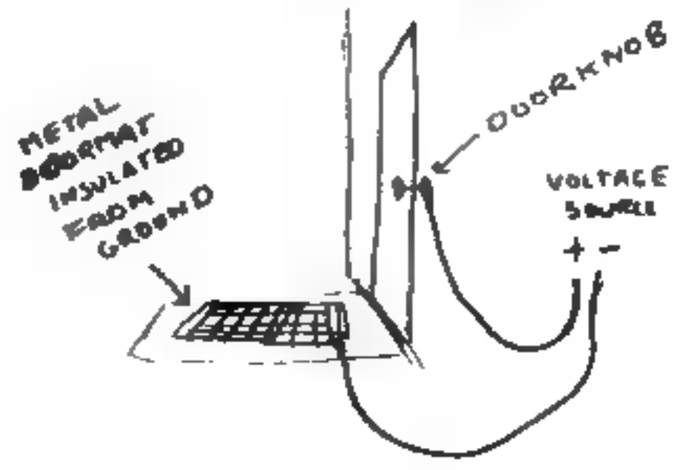


Fig. 3 Doormat Surprise

Army Type Air Pistol Easy to Build

THE MECHANICAL PACKAGE MAGAZINE 1931

SERIOUSLY surprising are the shooting qualities of this home-designed, home-made air pistol.

The idea for the gun came to Slide Rule Sam through a piece of mail addressed to him, and in turning it over to the editors, we quote the note he attached to the script: "It works. When I saw the idea and the sketch Eugene Amstus forwarded the Station the other day, I said it ought to make a good bunny-buster for that big jackrabbit that inhabits the neighboring Bar-Circle Bar-Circle Bar-Circle Bar-Circle cabbage patch. He's been thumping around under the Exp. Sta. shack a lot these winter nights, and I aimed to get him. We built this little gun according to Amstus' sketch and yesterday had rabbit stew. The thing is simple—just brass tubing thrown together with a soldering iron as the sketch shows. Run it. Great fun!"

As may be seen the barrel is of ½" outside diameter brass. A 3/16" bolt clamps in through a babbit seat in the breech for ramming out refractory shot when jammed.

The BB tube will have to be hand picked, and ought to be hard brass, just big enough to swallow a BB without trouble or friction. You'll have to adjust this to the shot you are using, as BB shot is never definitely standard.

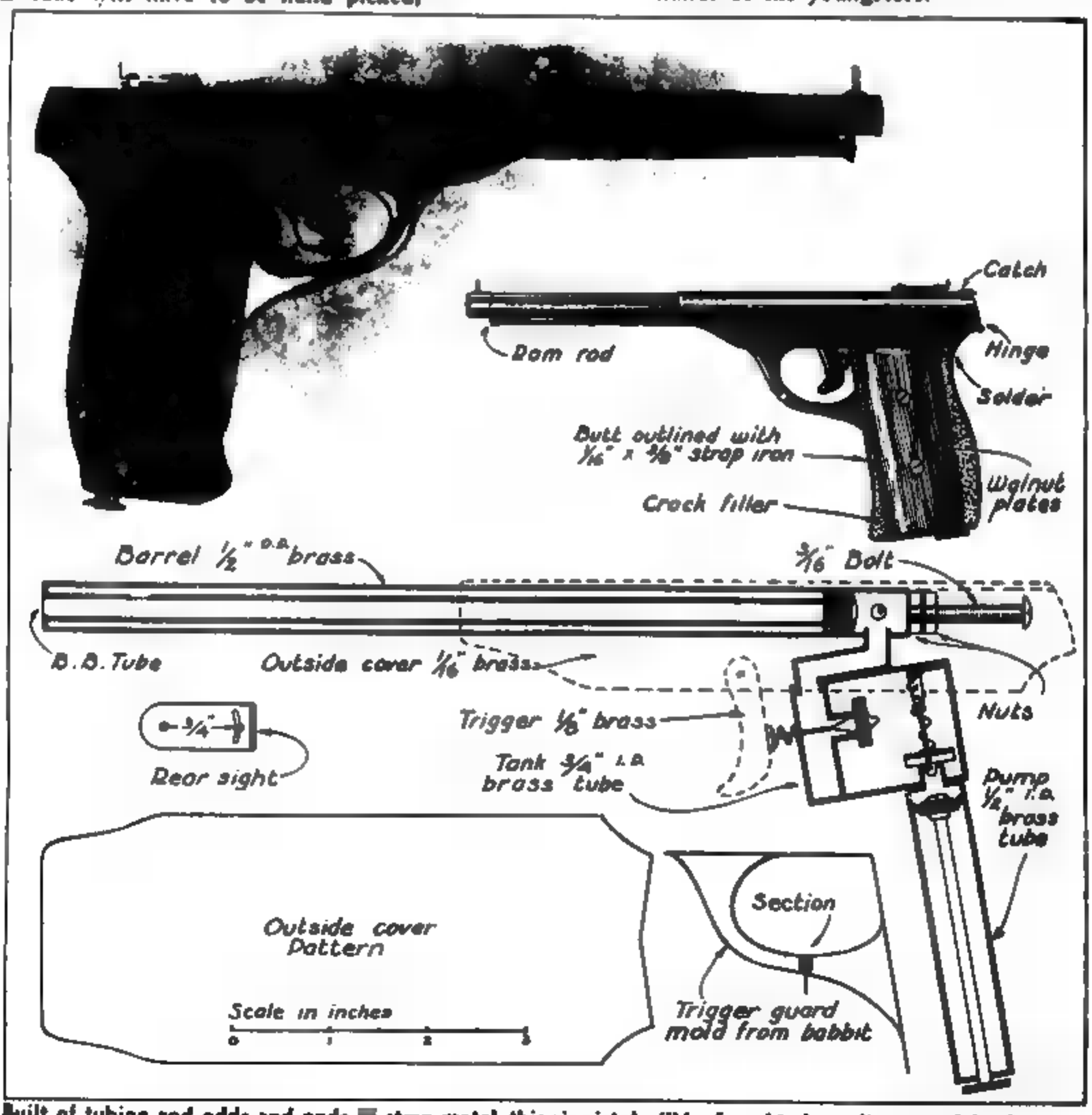
The pump barrel and the tank or concussion reservoir for storing air, are of brass tube. Use stiff springs for the valves, and cover them with oily leather, pounding them to a seat.

Outside cover pattern and trigger frame are of sheet metal. The stock is of walnut screwed to an outlined butt made of ⅜" by 1/16" strap iron.

A BB is rammed down, eight or ten good strokes taken, and the gun can then be shot. Muzzle velocity is controlled by the number of pump strokes.

Shoot at a pine board to test the pistol. If a BB sticks in this board at 25 feet you have plenty of power for target shooting and for bringing down small game like Slide Rule's jackrabbit.

This will be found a practical and useful little weapon if carefully made. A relief valve can be fitted limiting its power for use in the hands of the youngsters.



Built of tubing and odds and ends of strap metal, this air pistol will be found to be quite powerful. One was actually built at the Packmag Experiment Station as pictured and gave good results. Gun is muzzle loading.

THE MECHANICAL PACKAGE MAGAZINE 1932

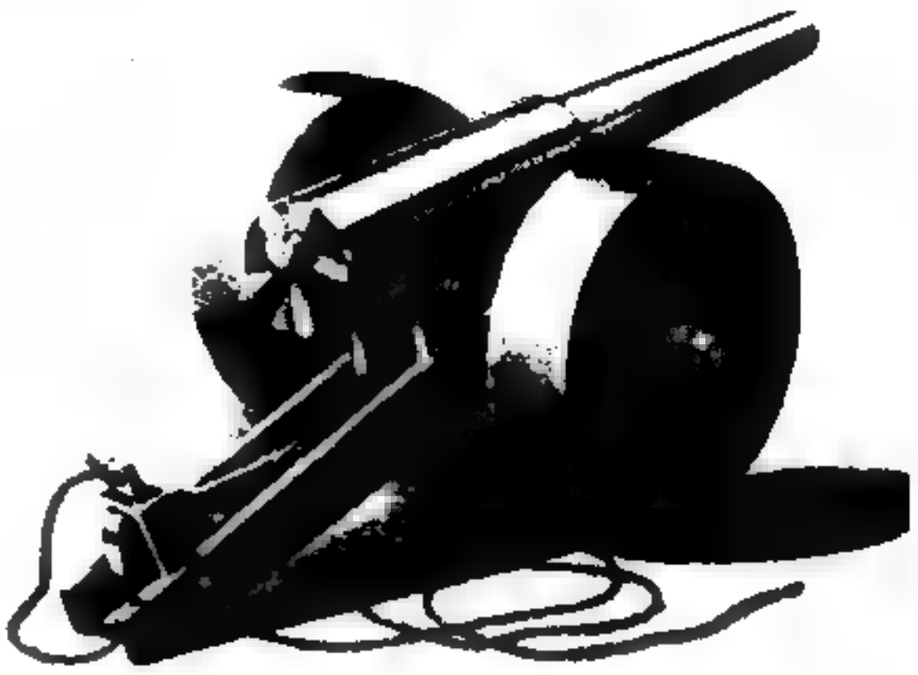
A MODEL Brass CANNON

Shoots .22 Caliber Cartridges

CLAUDE J. SISK of Washington, D. C., writes about a small cannon he has made out of brass and cold rolled stock, and which shoots .22 caliber cartridges, either blank or loaded.

Briefly his description runs like this: The gun can be made in any work shop which has a small lathe. The barrel is of round brass stock, and is ¾" in diameter at the breech and 7/16" diameter at the muzzle. The barrel is bored on the lathe with a No. 2 drill. The barrel is milled out, as shown in the drawing below, for the side clamps on the bottom.

The wheels are of wood, turned on the lathe. If close-grained hardwood cannot be had, use red fiber, altho hardwood is preferable.



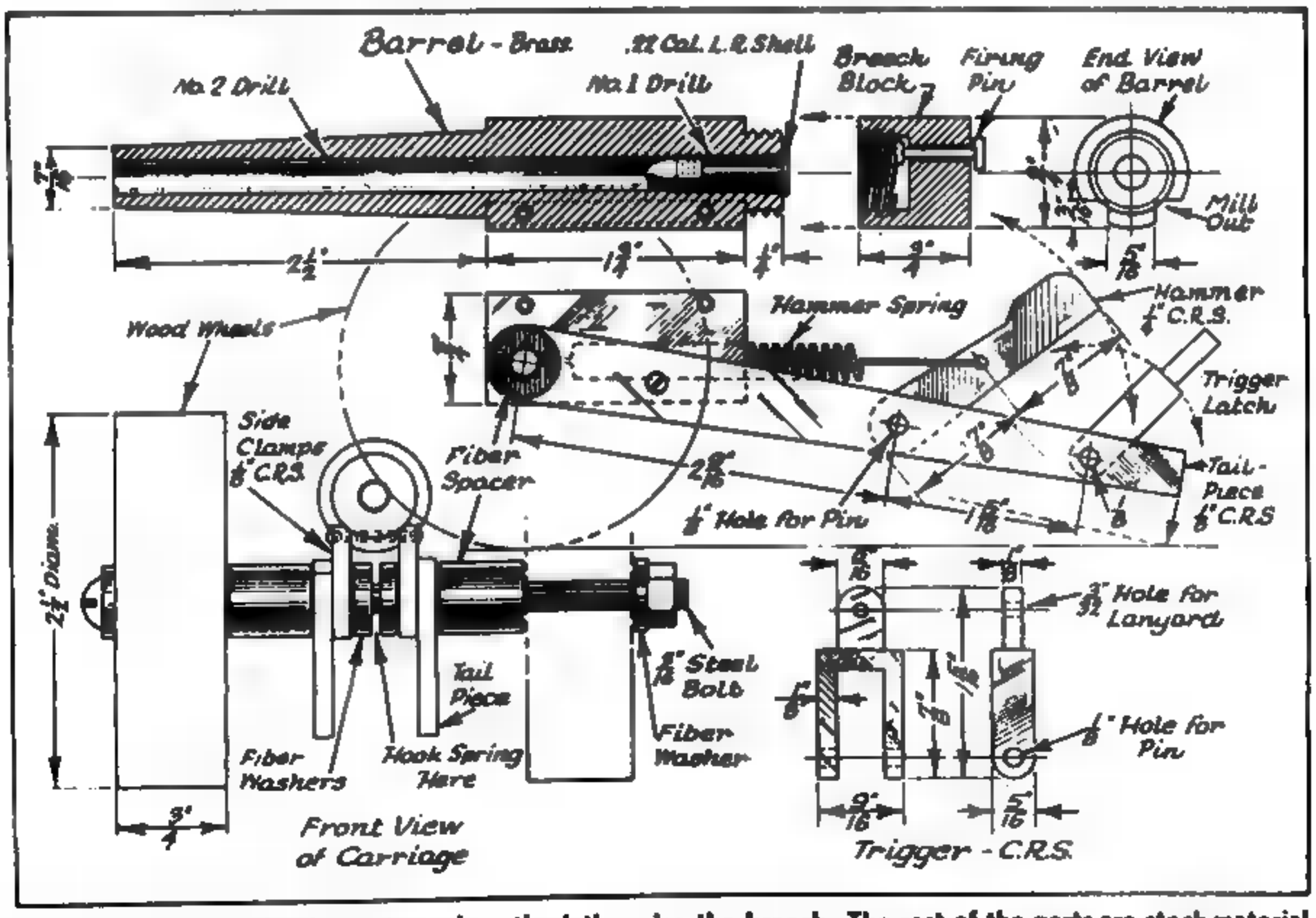
Here is an isometric of Claude Sisk's little gun.

Side clamps and tail piece are ⅛" cold rolled steel. Hammer is ¼" c. r. s.

The materials list: 1 pc. ¾"x6" round brass; 2 pcs. ⅛"x¼"x4¾" c. r. s.; 2 wood or fiber wheels; 2 pcs. ⅛"x¼"x1¾" c. r. s.; 4 spigot washers ½"; 1 pc. ⅛"x5/16"x4" c. r. s.; 1 pc. ⅛"x½"x1¾" c. r. s.; 1 length ⅜" screen door spring 2".

You will also need 1 pc. ⅛" round c. r. s. for rivets and the axle.

The fiber washers are to separate the frame and the fiber spacers on the axle. The trigger and the hammer can easily be worked out with a hack-saw, a drill press and a file.



The barrel and the wheels are turned on the lathe, also the breech. The rest of the parts are stock material. Note the breech with firing pin which is hammered by a cold rolled steel hammer. The trigger is pulled by a breech cord and can be made out of cold rolled stock by sawing with a hack-saw and then filing.

Harrassment as a Weapon

THE WEAPONEER is crammed with all sorts of goodies that will exterminate your enemies, but sometimes you don't want to kill or injure someone. You may want revenge for problems that don't justify violence, for being cheated, or for being harrassed yourself. This is the time for harrasament. There is also virtually no chance of being caught, because the overloaded police will not give serious attention ■ anyone complaining of unwanted pizzas being delivered. On the other hand, an explosion or corpse just might cause them to take notice. The following are a few simple ideas that have worked. They will really drive your victim nuts.

1) KEEP QUIET!! This is most important. Don't tell anyone who doesn't need to know about your project. Your victim can hear through the grapevine. You don't know who your drinking buddy might tell. Don't threaten your victim. Let him wait to forget about you. Use this time to learn his name, address, phone number, job, etc.

2) Send in magazine and book club subscription cards in his name. Order things C.O.D. for him over the phone. Sexually oriented publications are good, because they can cause a stir within his family and neighborhood. This will keep him busy with unwanted bills and merchandise.

3) Use the telephone. Read the Yellow Pages. Look for ads that say "We Deliver". Send him every conceivable product and service. These range from the obvious (pizzas, plumbers), to the bizzare (diaper services, gravel, manure). You can also send him salesmen, estimators, real estate agents and repairmen by telephone.

4) Sell everything he owns. Do this by placing classified ads in the paper in his name for his house, car, boat, and furniture even if he doesn't own any. This will keep his phone tied up constantly. You can also have him offer to buy old tires, aluminum cans etc. The cost of the classified ad can be billed to his phone bill.

5) Among the things that can be billed to his phone bill are flowers by wire, candygrams, and insulting telegrams signed in his name. All ■ these can be done over the phone, with no personal contact whatsoever.

6) Arrange over the phone to have his utilities shut off. You can also file a change of address card with the post office to divert his mail.

7) Most of the techniques outlined

WONDER COMPOUND FOR WARRIORS

by Kurt Saxon

No matter how well-armed you are, if your mind isn't calm, your judgement will be distorted. Being upset during a confrontation will give your opponent the edge every time.

Worse, in times of personal crisis or social upheaval your judgement may be so distorted that you may suspect friends of being foes. So you should have a good supply of the wonder compound I formulated to keep your mind alert and your ideas in perspective.

You can get the herbs described further on at any health food store and make up the compound yourself. You can also buy it in bulk quite cheaply.

I'm not a snake-oil salesman and since I won't be selling you this compound, you can be sure it acts exactly as I say it does. It has been well tested on many people, especially roughnecks and it doesn't turn a lion into a pussy cat. It just makes him a lion who knows who to spring at, and when.

Its main effect is to relieve stress. When you are angry, frightened, up against a situation you feel threatened by, your body releases adrenalin. This is Nature's preparation for fight or flight. If you can do either; if the situation plainly calls for one or the other, little stress is involved. But if you are frustrated; if either fighting or running away would be irrational, you freeze in confusion and helplessness. You spin your wheels and the adrenalin flows into your system, wasting itself in stress. You do nothing, as distorted impressions of reality flood in, making you feel only more helpless and insecure or angry.

Coincidentally, as I was taking a break from writing this passage, I was rereading George Orwell's "1984". The part I happened to be reading was from page 101. "It was at night they came for you, always at night. The proper thing was to kill yourself before they got you. Undoubtedly some people did so. Many of the disappearances were actually suicides. But it needed desperate courage to kill yourself in a world where firearms, or any quick and certain poison, were completely unprocurable. He thought with a kind of astonishment of the biological uselessness of pain and fear, the treachery of the human body which always freezes into inertia at exactly the moment when a special effort is needed. He might have silenced the dark-haired girl if only he had acted quickly enough; but precisely because of the extremity of his danger he had lost the power to act. It struck him that in moments of crisis one is never fighting against an external enemy but always against one's own body. Even now, in spite of the gin, the dull ache in his belly made consecutive thought impossible. And it is the same, he perceived, in all seemingly heroic or tragic situations. On the battlefield, in the torture chamber, on a sinking ship, the issues that you are fighting for are always forgotten, because the body swells up until it fills the universe, and even when you are not paralyzed by fright or screaming with pain, life is a moment-to-moment struggle against hunger or cold or sleeplessness, against a sour stomach or aching tooth."

Such deactivating stress builds up, not only in times of real crisis, but in situations of quiet desperation such as a dead-end job, an unhappy marriage, noisy youngsters, endless school work, debts, etc. One wants to strike out and smash or just run away. But honor or the law forbids, so one's world closes in and even real solutions are hidden because the adrenalin demands immediate action, which is impossible to one who has responsibilities.

The reason for such stress in homo sapiens is the conflict between the upper and lower brains. The lower brain is that of an animal, with the same drives and desires for quick action towards gratification as that of any dog. A dog will fight or run, mate, eat, defecate, as the situation presents itself with little apparent inhibition. He has no upper brain with its intricate programming of rules, regulations, choices, responsibilities or taboos and the endless dos and don'ts which makes the human stand and take it and be glad and prosper.

So when the lower brain makes its demands, the upper brain curbs the instinct for instant gratification and/or solutions. You must not smash the boss's head, injure the noisy child, clobber the whining wife, quit school, go AWOL, default on your debts, and so on. But all too often, the highest human types take on too many challenges and responsibilities. This is what causes such stress in superior men. So stress builds up so often and so long that even the best of men can refuse to ■ that extra mile or even yard.

What my compound does is suppress the irrational impulses of the lower brain. That's what tranquilizers such as Valium, Thorazine, and Librium do. But they also suppress the working of the upper brain, causing dullness and disinterest, almost like a lobotomy. They also dull the reflexes. Furthermore, after a few months on tranquilizers, the user becomes addicted and stopping brings on the same withdrawal symptoms as stopping heroin.

My compound not only quiets the illogical demands of the animal brain but has no effect on the upper brain. For instance, I found I could score better on tests. Since the compound took away my nervousness, my upper brain could concentrate better.

■ also gives a feeling of well-being. One of my friends, Russ, was a drug-pusher and dealer. I had made up some of the compound into a tea and gave him a double dose; eight ounces. Within three minutes he was actually high.

He believed I had a super dope and talked of pushing it. It was a little hard to convince him that he was just feeling normal, as he hadn't for years. Up until then, the only high he had

above can be done to him at work. This will screw him up with his boss too.

8) Watch your timing. Send in change of address cards so his mail won't be diverted just when all the unwanted stuff will arrive. Don't disconnect his phone just when all the folks are calling about his ads. Do send deliveries and salesmen at odd hours, and send them ■ one day, but not all at once. Let the pressure build. Make him remember "The Night of the Pizzas" and "The Day the Gravel Came".

I'm sure this has got you thinking of other devilish ways to get someone. These are just the basic pointers and easy techniques. When it ■ not justified to physically destroy a person, you can easily psycologically destroy them in a blizzard of red tape, bills, magazines, and pizzas.

Scientific American—July 27, 1861

ELECTRICITY FOR EXPLODING GUNPOWDER

In a recent lecture in London by Professor Abeel, F.R.S., and Director of the chemical establishment of the War Department, he stated that an extensive series of experiments had been made for ascertaining the different forms of electricity which were the most advantageous for exploding gunpowder. The Ruhmkoff coil, by which electricity of high tension is obtained, he considered was the best. What is called the "magnet fuse" has been used very successfully in firing gunpowder with electricity. It consists of two fine copper wires, each covered separately with gutta-percha, then both placed alongside, and bound together with an outer coating. It is then cut into short lengths, exposing the copper wires at the ends. Moistened gunpowder is placed upon the terminals or ends of these fuses when placed in the mine that is charged with powder to be exploded. A spark of inductive electricity sent from a Rhumkoff coil fires the moist gunpowder at the end of the fuse, and explodes the charge with certainty. This moistened gunpowder is prepared by mixing the fine-grained quality with a dilute alcoholic solution of chloride of calcium. A large supply of such fuses, with prepared gunpowder and a large magnetic apparatus for generating electricity, furnished a portion of the equipment of the British army during the late China war and the obstructions to the expedition on the Peiho river were cleared away by electrical discharges.

The charges of powder which are used for blasting under water and in mines with electricity, are either inclosed in a tin case or a bag of India-rubber, with the magnetic fuse placed in the middle, and connected with the conducting wire to the magneto-electric machine which develops the sparks. For field and mining operations in military engineering, a magneto-electric machine is more convenient than a galvanic battery, and a very small apparatus, made with Beardslee's American cast iron radial magnets would, we think, answer admirably for such purposes.

An improvement in the magnet fuse has lately been made in rendering the priming composition more sensitive by using a mixture of phosphide and sulphide of copper and the chlorate of potash. This priming is put upon the terminals of the copper wire, and it is iguited with the smallest size of magneto-electric machines—such as the 6-inch horseshoe magnet and a rotating armature used in America for medical purposes.

known was from the dope he made his living pushing. He was not the person to spread the word.

I next put Paranoid George ("Wheels Of Rage", THE SURVIVOR, Vol. 3) on the compound. For days he was really sharp and efficient. But he stopped taking it and returned to his old security blanket of paranoia. He explained that he had stopped taking it because it kept him from being alert to the plots being hatched against him.

Neither Russ nor George stayed on it. Being artificially high was Russ's natural state. His only close friends were dopers and his only income was from pushing. He had a psychological, social and financial interest in being abnormal and so Hell was his chosen condition.

Paranoid George, ex-Stormtrooper, ex-biker, was in a constant state of Red Alert. He had no goals to be motivated toward. Normal pursuits held no interest or excitement for him.

In a way, both Russ and George were clinically insane. But the compound worked! And if it worked when taken by two with no purpose, how much more effective would it be with someone with a destiny?

But say you've not had enough shocks to your system to need the compound on a steady basis. Say, also, that your working and personal life is blissfully tranquil so you never need the compound. Think how things will be when the pharmaceutical companies go out of business and the millions of tranquilizer-dependent wretches are cut off and going crazy? You could trade or sell the compound for all the traffic would bear. You wouldn't need to worry about the health food stores running out. You can grow it yourself.

This compound is simple, legal, easily available and much cheaper than tranquilizers. It is a compound of equal parts, by weight, of hops, chamomile, valerian (the basis for Valium) and scullcap. ■ can be gotten from any health food store. To get it cheaper and in bulk, you ought to order five pounds of each from The San Francisco Herb Co. Twenty pounds of it, a couple of year's supply, will cost only $78.00. Their toll-free number is 1-800-622-0768 in California and 1-800-227-4530 out-of-state. They send U.P.S. collect.

When you get the herbs, powder them in a blender.

There are three ways of taking this combination of herbs. One way is by making a tea. An ounce of each herb is stirred into two quarts of boiling water. As the water resumes boiling after the herbs are stirred in, the pot is taken off the heat, covered and allowed to set for an hour to allow the herbs to steep.

Have another pot ready with a sieve or collander. Put a cloth in the sieve or collander and pour the tea in. After the straining has stopped, twist the cloth so the herbs are in a ball and most of the liquid is out. The spent herb can be combined with the next spent batch and resteeped. This makes the herb go 50% farther.

The first dose should be eight ounces. After that, four ounces every few hours will keep you tranquil, with no side effects.

In the daytime the nerves are soothed so you are very alert. At night, the nerves are soothed so you'll sleep soundly. If you take sleeping pills, substitute the herbs.

If you are really down, the herb will give yu an actual high, as with Russ. After that you'll level off and from then on, if you take it regularly, you'll just be normal. On the other hand, four ounces given to a person who doesn't need it will have no effect at all.

The hops gives the tea a rather bitter taste, which some people can't stand. Others learn to like it.

If you can't stand the taste of the tea, you can take it in its powder form. Actually, in its powder form, the herb goes much further. The only difference is that the tea takes effect in about three minutes, whereas the powder takes ten. The tea is better for getting back to sleep if you awaken in the middle of the night.

To use the powder, take a rounded teaspoonful and dump it on the tongue. Don't breathe in or you'll get a coughing fit. As soon as you get it in, wash it down with water or juice.

Aside from going further, the powder is more portable so you can easily take a packet to work or on trips.

If, for some reason, you can't take it in tea or powder form, go to your pharmacy and buy a box of 100 No. 000 empty gelatin capsules for about $5.50. Open them and pack them very tightly with the compound. About four is the usual dosage.

This compound also cures alcoholism. People are always saying that alcoholism is a disease. Not so. The alcoholic is a depressive.

Alcohol relieves the depression. But it takes B vitamins from the system, causing even greater depression. Drinking, even in the daytime is preferable to the awful depression.

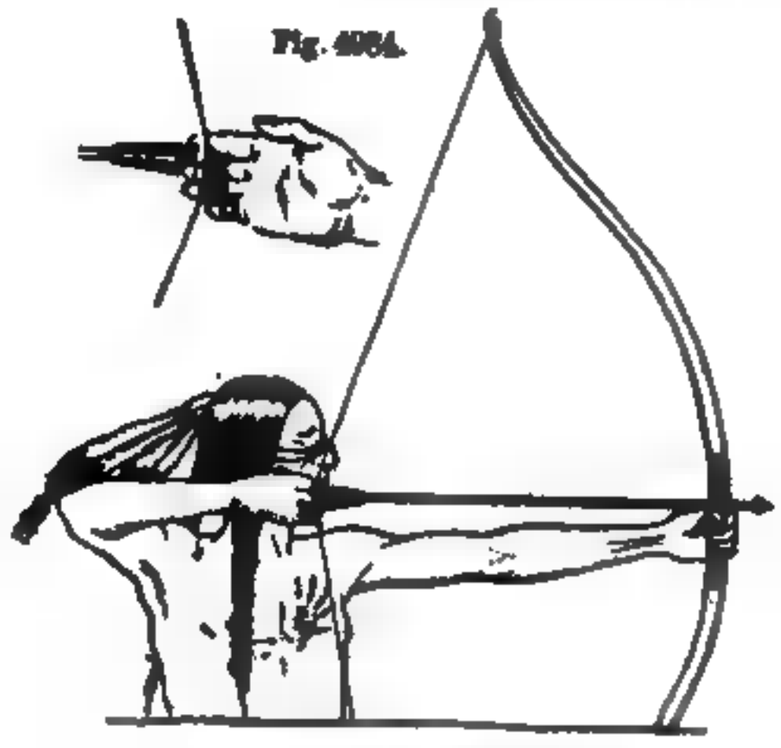
To prove this, take four ounces of your favorite liquor mixed with four ounces of the tea. Sip it along as you might normally do. You might get mellow, but you won't get drunk. Even after eight ounces of whiskey mixed half and half. It works but it's a waste of good booze.

If you're trying to quit smoking and you get a nicotine fit, take some of the compound. Much easier.

If you're fat and have trouble sticking to your diet take some of the compound when you just have to pig out or go crazy. You'd be surprised how quickly the urge to overeat leaves you.

With a supply of the compound and your nervous system stabilized, you'll be far better able to command or organize than the confused creatures all around you. Remember, in the counry of the blind, the one-eyed man is king.

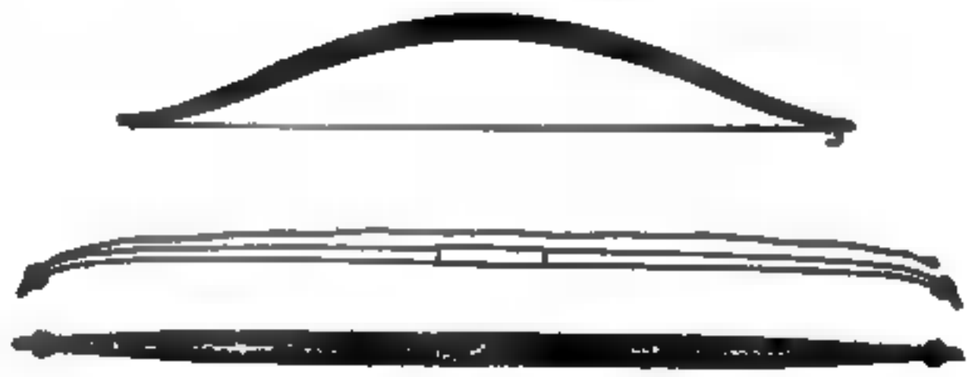
How Indians Made Their Bows and Arrows



Position in Drawing the Bow

For target work the English bow is far superior to the Indian bow, so that you will do better to make your tackle according to the directions in one of the standard books on archery if you are interested in doing expert target work. The Indian bow, however, does not require the expensive materials used in making a good English bow, nor is it so difficult to construct. Materials for making good Indian bows can be found in almost every part of our country, and the Indian's method of bow-and-arrow making is simple enough to be followed by any good camper.

The best bow-makers on the plains were the Sioux and the Crows. Like nearly all of the other Indians in the West, they used a bow about four feet long. In the East a longer bow was used by some tribes, but the short bow is the common Indian type. This short length is one of the chief ways in which Indian bows



Sinew Backed and Decorated Plain Wood Bows (51)

differ from the English. The proper length of an Indian bow was sometimes determined by holding the bow-stave diagonally across the body, with one end of it held in the right hand at the hip and the other just touching the finger tips of the left hand when held straight out to the side, shoulder high.

Bows were made of wood, wood backed with sinew, and of mountain-sheep, buffalo, or elk horn. Almost every wood found on and around the almost treeless prairies was utilized for bow-staves, Osage-orange, or *bois d'arc,* as it was called by the French voyageurs, was considered to be the best wood, but, because it grew in a small area and so was difficult to obtain, hickory, juniper, oak, ash, white elm, cedar, ironwood, and willow were more commonly used. The Eastern Indians made their bows from shagbark hickory, ash, red cedar, white oak, willow, birch, and hemlock, while in California hickory, ash, mountain cedar, juniper, willow, elder, and yew were used. The latter is considered to be the best wood of all.

Omaha Bow-making

The Omaha considered the "month of the return of the geese," or February, to be the only safe time ■ cut green wood for bow-staves. Then the sap was down, so that the stave would season with little danger of splitting by shrinkage. A young ash killed by a prairie fire was especially good bow material, for it was generally well seasoned, and so unlikely to be affected by rain or dampness. When cut and trimmed, the green stave was rubbed with bear's grease and hung from the upper part of the tipi poles in the smoke of the fire, but well out of reach of the flames, until it was well seasoned. When the wood was ready for use it was carefully shaped out with a knife and rubbed smooth with a piece of sandstone. The work might take a week, or on a fine horn bow the warrior might spend a month or more.

Ordinarily, the bows were perfectly flat when unstrung, but they were sometimes gracefully curved. The curves were put in the wood by greasing the part and holding it over the fire until it was quite hot, and then bending it with the foot. It was held in place until cool, when the curve would be permanent. Sinew backing was applied with hot glue to the flat back of the bow, which had been roughened with a stone. The sinew was lapped at the middle and ends and on the middle of the bow. Horn bows were made of thin slices of horn that had been rubbed down until they fitted nicely together. Four pieces were glued together, and a fifth piece fitted and glued over the center. All were then rubbed down until they were of correct proportions, after which they were tightly bound with strips of the small intestines of deer or strips of sinew which were applied when wet. As it dried, the sinew shrunk, so uniting all of the parts and making a bow that was said to be tougher, stronger, and more elastic than a bow of other materials. The chief disadvantage of horn and sinew-backed bows was

that they were likely to become useless in wet or damp weather.

For bow-strings twisted sinew or vegetable fibers were used. The string was tied to notches in one end of the bow, while its noosed end could be slipped over a notch in the other.

For our bow we will take as a pattern a common type used by the Sioux or Dakota. When finished, it will be forty-four inches long, an inch and a quarter wide at the center, and five-eights of an inch at the ends

Fig. 85. Dakota Bow

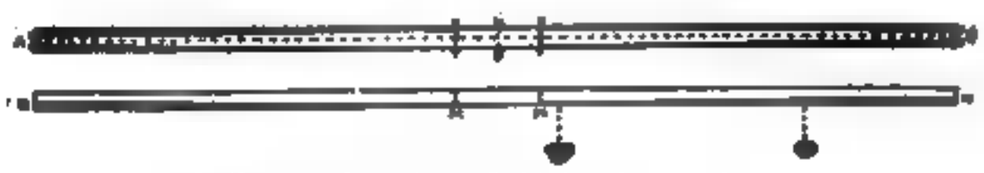


Fig. 86. Bow Stave Laid Out for Planing

(Fig. 85). You may cut and season your own stave, or, if this is not possible, a bow-stave may be purchased from a dealer in archery supplies. A piece of wood bought at a lumber-yard is not likely to prove satisfactory, as lumber is often kiln dried, which makes it too brittle for use. If you cut your own wood, you can do no better than to select one of the woods used by the Indians.

The first thing to do is to dress the sides and ends of the stave smooth with a jack plane. Two of the sides will, of course, be parallel to the grain. Select the smoothest of these sides, or, if you have cut your own stave, the one that was nearest the bark, for the back of the bow. On this side lay off the middle line AB (Fig. 86). Now carefully dress the stave down so that it will be forty-four inches long, an inch and a quarter wide, and three-quarters of an inch thick. Next determine the exact center of the stave, CD, and square lines around it two inches above and two inches below the center mark. This space is for the hand grip. At each end of the stave, now mark off points three-eighths of an inch on each side of the middle line and draw to them the tapering lines YZ. Lay off the same lines on the under or belly side of the bow and plane the stave down to them.

Turn the stave on its side and mark the point N at each end, which is one-half inch from the edge of the back. Draw the diagonal lines MN on each side of the stave and plane down to them on the belly side. Now, with a spoke-shave and plane carefully round the belly so that it conforms to the sectional diagrams. Here again the Indian bow differs radically from the English. In the latter the belly is rounded to a perfect arch, while the Indian bow has almost flat sides. Only the edges of the back are rounded. Notches in the ends of the bow, for the bow-strings, are made as indicated in Fig. 87. They are best made with saw and small round file. The bow-string itself can be made by twisting three triple and well-waxed strands of heavy linen thread together, or it may be purchased ready made from a sporting-goods store.

Don't try to complete the work, especially the planing, too quickly. Many a good bow has been spoiled because the maker was too anxious to try it out. Set your plane fine and go slowly when using it. Test the

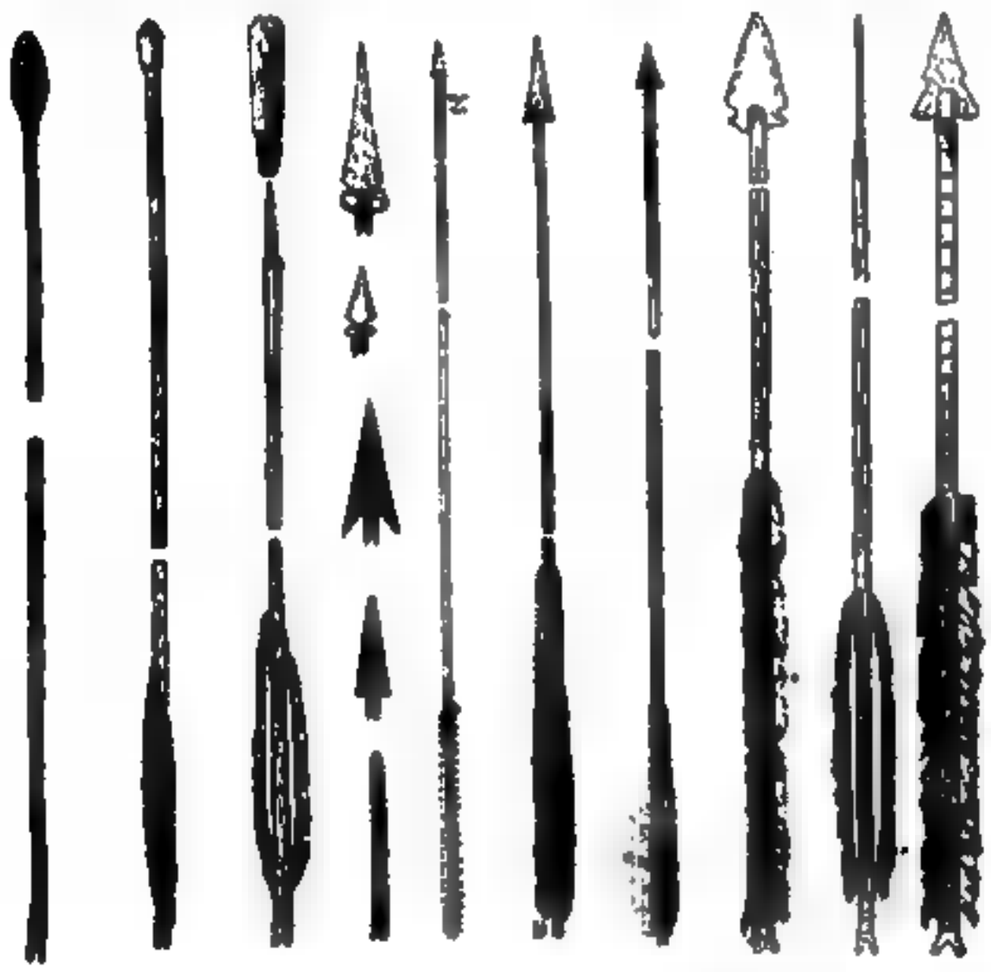
Fig. 87. Bow End with Notches for String

bow carefully, when it is finished, to see that it bends evenly. If it does not, plane a bit off the stronger end. When finished, it may be rubbed with linseed oil or painted with Indian decorations. Keep it unstrung when not in use.

An Assiniboine Bowman (AMNH)

Arrows were more difficult to make than bows. Generally, each man made his own, so that it was only by chance that the arrows of two men in the same tribe would be of the same length. Because of this and also because each man could recognize his own handiwork, the arrows in a carcass served as a means of settling disputes of ownership, which often arose after a great tribal buffalo hunt. Ash, birch, cane, dogwood, willow, and wild cherry-tree saplings were used for arrows. Like the bow-staves, the arrow wood was cut in winter. Sticks were selected that were free of branches, straight, smooth, and about the thickness of one's little finger. They were cut to proper length, put up in bundles of twenty or twenty-five, wrapped tightly

with raw-hide or elk-skin, and hung in the smoke of the tipi fire for several weeks. When seasoned, the bundles were taken down and the bark was removed from the sticks. They were then scraped, smoothed, and straightened. This was a difficult and tedious process. Wherever a crooked place was found, it was greased and heated until the wood could be easily bent, after which it was held securely until it cooled. Sometimes the sticks were drawn through a stone or deer's horn, in which holes had been drilled, as a part of the straightening process. Grooved sandstone polishers, between which the sticks were twirled, were used in



Bird Bolts and War Arrows from Various Tribes (81)

the final shaping process. A U- or V-shaped notch, or nock, as it is called, for the bow-string was made in one end of the shaft.

The arrowhead was now fastened in a notch in the shaft with glue and a binding of sinew. In the old days it was made of flint, obsidian, and other varieties of stone, as well as of sinew, horn, bone, shell, wood, and copper. Later traders introduced the sheet-iron arrowpoint, which soon displaced the native materials. Arrowheads made of turtle, bear and panther claws were supposed to strike the enemy with magic power ■ well as with the force of the bow. Sinew arrowpoints were made from the hard sinew that lies along the top of the buffalo's neck and holds his head up. They were considered to be of special value in hunting buffalo because the sinew point striking a rib would go round it, whereas a flint point hitting the bone would often break off. The heads of war arrows were loosely fastened, and so shaped that they would split the shaft and remain in the wound when the shaft was withdrawn.

After the point was in place, the shaft was grooved with three zigzag lines. Just why this was done is not exactly known. Some claim that the grooves represented lightning, others that they caused the wounded animal to bleed more freely, while the Omaha state that they help to keep the straightened shaft from warping.

Finally, the arrow was feathered with two or three trimmed feathers of the eagle, owl, hawk, or other bird. These were glued and bound in place with sinew. The glue used was made from shell of a soft-shell turtle, deer hoofs, or chippings from a rawhide. Between the points where the feathers were fastened were painted bands of color, generally black and red. These colors represented night and day and were a symbol of precision.

Making a good arrow has always been considered a harder task than making a bow, but this need not discourage you. With the materials and tools of civilization you will have a much easier job than did the Indian boy who attempted his first arrow. Cut and season your own wood and follow the Indian method of making arrow shafts or, if you want to make the task as easy as possible, purchase ordinary commercial dowels from a lumber-yard or sash-and-door mill. These are generally made of birch, which is an excellent arrow wood. The size you will want is five-sixteenths of an inch in diameter.

Pick out the straightest and clearest shafts, and with sandpaper remove any slight inequalities they may have. Pick the best end for that in which the head is to be fitted, and in the opposite one saw the nock, which should be one-quarter of an inch deep. Finish it with a small file and carefully round its edges with sandpaper so that it snugly fits the bow-string.

Feathering comes next. Turkey-wing feathers, secured from the butcher at Thanksgiving and Christmas, or purchased from a millinery supply house, are the best. Use those from the same side of the wing for the same arrow. With a sharp knife split the feather. Then clean out the pith and with scissors trim off the excess quill. With the scissors cut feathers to shape as indicated in Fig. 88. The full length of the finished quill should be six and a quarter inches; that of the vane, five and a half inches. The latter is one-quarter of an inch wide at the front, and three-quarters of an inch at the rear. Finish them in sets of three and put them aside until you are ready to feather the arrows.

With a pencil, now mark off on the shaft the places where the feathers are to go. One inch and a quarter from the end of the arrow draw a circular line. This is for the rear binding. Four and three quarters inches from this draw a similar line which marks the beginning of the front binding. At right angles to the nock draw a perpendicular line which indicates the position of the cock feather. Two similar lines are drawn equidistant from this, for the other feathers. When all are set they will appear as in Fig 89.

We are now ready ■ glue and bind the feathers. Put a thin coating of glue on the feather and on the pencil line indicating its position, and allow it to partially

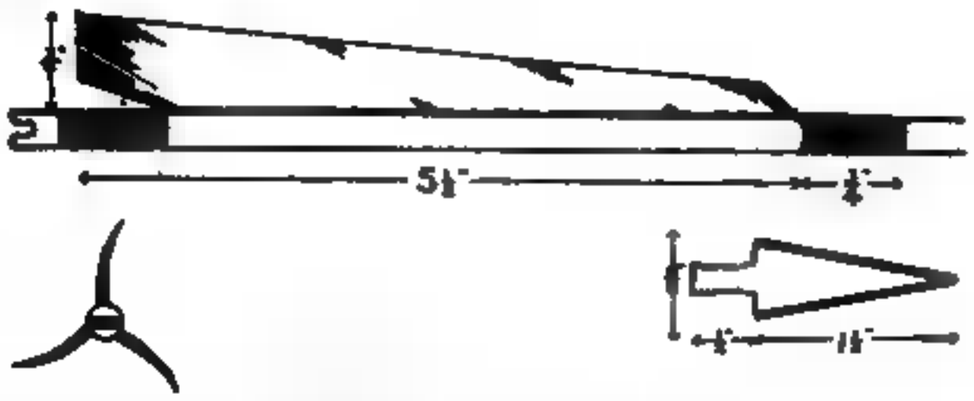


Fig. 88. Method of Feathering Arrow Fig. 89. End View of Arrow Fig. 90. Iron Arrow Point

set before pressing both together. Pins may be used in each end of the quill to hold the feathers in place

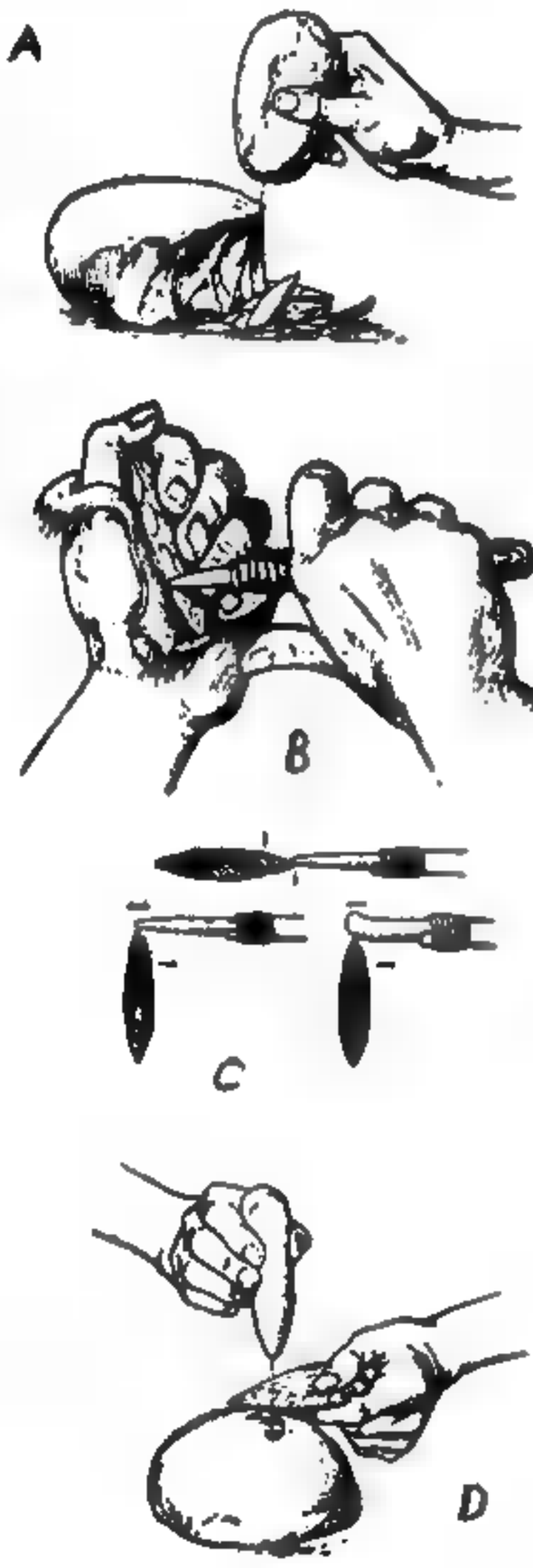


Fig. 91. Chipping Flint Arrow Points (BAE) (A) Making Flakes (B) Chipping a Flake with a Bone-pointed Tool (C) Position of Tool and Flake ■ Chipping (D) Chipping with a Hammer Stone.

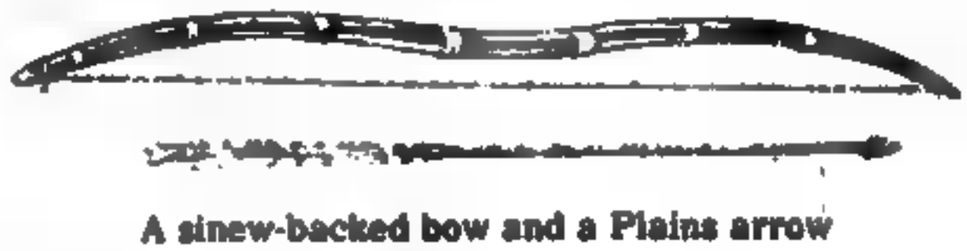
until all three are glued to the shaft. When they are in place baste them down by a spiral binding of cotton thread wrapped between the bristles of the feather. If necessary, adjust the position of the feathers as this basting is put in place. When the glue dries, remove this basting and wrap and glue the permanent bindings of colored silk thread to each end of the feather. The hardest part of the work is now over.

Now for arrowheads. The easiest to make are those of iron, like the ones the Indians first got from white traders and which they later made from scraps of iron that happened to fall into their hands. These varied in style in the different tribes and according to the use to which they were to be put. For them you will need some one-sixteenth by five-eighths inch spring steel or band iron, which you can get from a hardware store or blacksmith shop. With a hack saw roughly shape the point according to Fig. 90. Use a file to trim up and sharpen the edges and to make the notches for the binding cord in the shank.

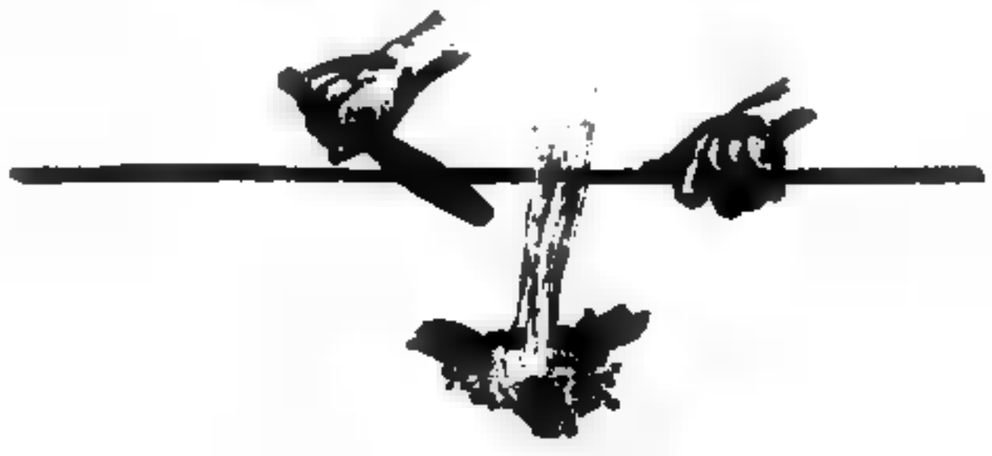
Round off the end of the arrow and saw a notch in it three-quarters of an inch deep, ■ receive the head. Glue the point in place and bind it, while the glue is soft, with button-hole silk thread. You now have an Indian bow and Indian arrows such as were carried on buffalo hunts and the war trail by the warriors of the plains a hundred years ago.

Chipping an Arrowpoint

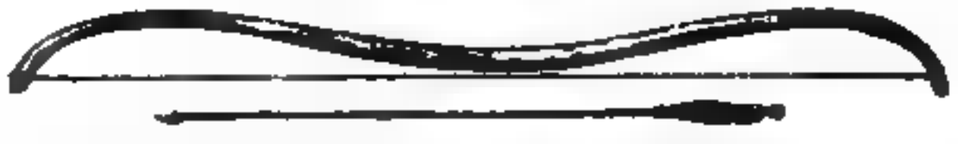
Some day you may wish to try your hand at chipping out flint arrowheads. The drawings in Fig. 91 show how to do it. Flint, quartz, or obsidian, suitable for this purpose, can be found in almost every part of our country, and if you have trouble in finding suitable natural material, remember that with care and practice good heads can be chipped from pieces of glass bottles. The equipment needed is simply a pad of heavy leather for the palm of the hand and a chipping tool of deer horn, bone, or steel. The piece of flint or glass to be chipped is held in the left hand on the pad and the chipper is pressed firmly against the edge of the flint until a chip breaks off. Take off but a small chip at a time. Patience and care are needed if you are going to master this ancient art.



A sinew-backed bow and a Plains arrow



Straightening an arrow shaft



Iroquois bow and arrow. The hole for the bowstring is unusual.

The Scientific American
1861

HALE'S MODE OF PROPELLING SHOT AND SHELL.

The famous congreve rocket, which was invented in 1804, was cobdemned by the Duke of Wellington as being more dangerous to the army that used it than the enemy, from the uncertainty in the direction of its flight. It has often occurred to us that the principle of propelling rockets might be applied to cannon shot, in connection with a tube of sufficient length to insure the flight in the desired direction, and we here illustrate a plan invented by Mr, William Hale, of England, for accomplishing this.

The rocket-shell is represented in Figs. 1 and 2. The shell, *a*, has a long iron cylinder, *b*, attached to its rear end; this cylinder being filled with meal powder, *c*, compressed, so that it will burn slowly. The burning of this powder generates hot gases which exert a powerful pressure against the whole interior of the cylinder, and by making holes in the rear end of the cylinder, a portion of the pressure is removed from this part, leaving the pressure against the for-

Fig. 2 *Fig. 1*

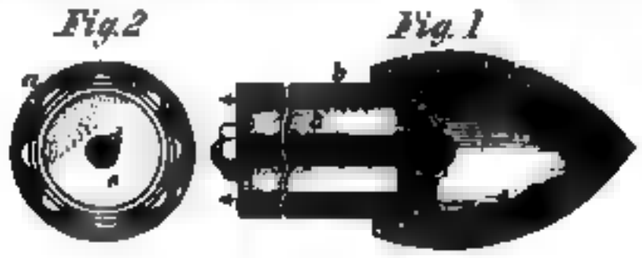
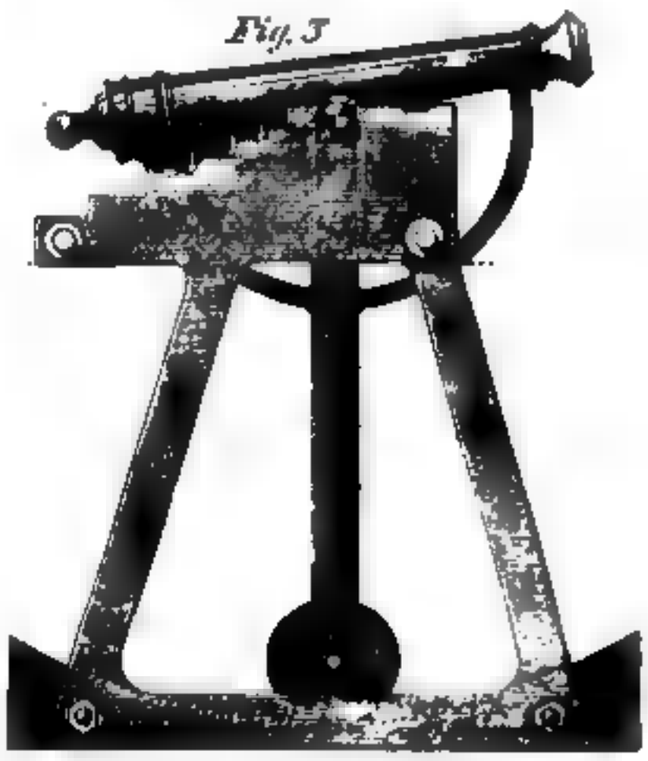


Fig. 3



ward end not fully counterbalanced, which accordingly driven the missile forward in that direction. A central rod, *d*, holds the plate, *f*, securely against the rear end of the cylinder, and serves to distribute the propelling powder in the annular chamber around this rod. A space is left within the cylinder around the outside of the powder, so that the powder may burn from its external surface inward, and when the fire reaches the central rod, it lights a fuse which explodes the powder in the shell.

Fig. 3 represents the apparatus for starting the shell in the desired direction of its flight when used on board ship. A slit is made through the deck, *k*, of the vessel for the sliding back and forth horizontally of the frame, *h h*, and pendulum rod, *e*; the gun, *b*, being supported on the rollers, *i i*, which run upon the deck by the sides of the slit. A curved railway *g*, is fitted to support the rolling pendulum, *d*, so that as the vessel rolls, this heavy pendulum will preserve its vertical position, and thus keep the gun in a horizontal position, or at any angle of elevation desired.

Mankind were never more earnestly engaged in improving instruments for destroying each other than they are at the present time.

The Fantasy of Survival Through Deadly Force

By KURT SAXON

The first network TV show I was on (Speak Up America) featured a segment with Mitch Werbel, of Cobray International. He runs an all-inclusive combat school ■ help mostly white-collar types act out their macho fantasies.

He said, and I must paraphrase since I didn't record it, "I don't go with storing food and such. The only way you're going to survive is to learn how to kill".

The TV people may have edited out any qualifying statements. I hope so, because, as it stands, that attitude is stupid and actually destructive ■ long-term survival goals.

Two popular scenarios give a lot of people the idea that killing one's fellows will be all the rage. The first is that eminent socio-economic collapse will turn every neighborhood into a battleground between the haves and the have-nots; the stocked-up versus the improvident, the ants versus the doomed grasshoppers, etc. After a few weeks of chaos the government will reorganize and reinforce law and order.

The second, and silliest, is the scenario which tells of the Survivalist seemingly dying of old age after interminable battles with a never-ending list ■ enemies. The world has sunk into perpetual barbarism. Valhallah!

The first scenario appeals to urban types who can't conceive of a world they don't fit into. Their city is eternal. It needs them. When the chaos comes they will defend it from foreign enemies and, at the same time, liquidate the internal vermin dragging it down.

I compare the modern city to the lower bowel, a collection place for the dregs and waste of the body. The majority of urbanites are the used up and/or the useless. By the time the surplus population of your city is wiped out, it will no longer, and probably never again, be a functional metropolis. Your livelihood will ■ gone and you will be just another refugee with little chance for safe passage to a rural haven. Your only contribution to the future will ■ a negative one on your part. If we are lucky, you will simply have killed some sub-humans who might otherwise have become a threat to valuable rurals.

Disabuse yourself of the idea of government help in reconstruction. The Feds are so obsessed with catering to the helpless and hopeless that you are already enslaved on their behalf. "From each according to his ability", Acts 11:29, "To each according ■ his need", Acts 2:45, is the bottom line of the Bible, Karl Marx and our Federal Government. Hope against hope that the government is destroyed before it gets around ■ "helping" you.

The Gung-Ho Survivalist who fancies himself an eternal warrior or warlord, keeping himself alive by looting urbanites and then rurals is plainly and simply doomed. His mastery of martial skills will leave him about as useful as a muscle-bound sports "hero" in a machine shop.

After the collapse, only the versatile will be useful. The narrow specialist, whether he ■ ■ high technology, or a Brinks guard will serve no more purpose than teats on a bull.

The danger to the weapons freak is a false sense of security. He believes he can defend his holdings from ■ comers, or, ■ he has none, ■ can take what he needs from others not so well armed, or he can hire out.

Defending an untenable position is stupid. Surviving urbanites may only be refugees, leav- ■ most of their holdings behind and finally being killed off by hostile rurals.

Hiring out will only be temporary. The Great Culling will exterminate those with the need ■ take what they haven't earned.

Another thing to consider is that if your only skill, your obsession, ■ killing, you won't ■ allowed to survive. I recall a story I read about the WW II Rangers. ■ seems two ■ them were on leave and in a bar. A customer tapped one on the shoulder, meaning to ask for a light. The Ranger spun around and commenced to injure him seriously. That set the other Ranger off and the two destroyed the bar, killing a couple ■ the merrymakers and injuring several more.

They were so keyed-up and over-trained they were psychotic. That incident and others caused the order to go out to put them in the forefront of every battle from then on. Few came back from the war.

I often see TV clips of Soldier of Fortune get-togethers. There they all are, banging away with whatever degrees of automatic weapons the local laws allow. Then they show off their hand-to-hand prowess and throw each other all over the lot. Then the knife fighting, Kung Fu, etc.

Most of them are decent men with regular jobs, just hobbying. They're all right, but there are some among them who live for the day when they can ■ free ■ kill anything that moves. I hope they all do yeoman service in the coming urban hellishness. But they will not be needed for long in a rural environment.

Take Boone County, Arkansas for instance. Harrison is the county seat. Here, we have a good police force. We also have a Sheriff's department, a National Guard unit, an Army Corps of Engineers and State Troopers quartered here. Unlike urban lawmen, they won't desert to care for their own families in other areas. They live in the community and are a part of it.

Nearly every able bodied civilian is a veteran with good military training. Also, nearly every able-bodied male was raised as a part-time hunter. I've never met a man here who didn't have several guns. Boone County is a garrison state without meaning to be.

There are seventy miles ■ armed hillbillies between me and the nearest city. Aside from having it out with wandering infiltraters, I'll probably see no action at all, if I'm lucky.

In my downplaying of the importance of weaponry I don't mean to belittle readers ■ **THE POOR MAN'S JAMES BOND** or **THE WEAPONEER** or any other such works. Learning ■ make things for yourself, even weapons, is a step forward for one otherwise totally dependent on others for one's manufactured wants and needs and especially one's safety.

I think the average Karate buff takes ■ up on the chance that he'll eventually confront a couple of punks who might otherwise hurt him. So if you buy books on weaponry against just such an emergency, that's fine. At least you don't use up all the time and money ■ takes to get a Black Belt.

But your brain is your most powerful weapon. You shouldn't limit it to the handling of emergencies that might never arise in your case.

Part of the reason for this editorial is that I checked and found that only about 20% of you have a full set of **THE SURVIVOR.** When the mail stops and **THE SURVIVOR** is no longer available, a set would get you a place in any survival group or community.

In the meantime you can use your weapons-making skills to turn out more domestic products for sale. You'd also be surprised at the money you can save by making things you need now, ■ the gifts you're committed to giving and even ■ the weaponry in **THE SURVIVOR.**

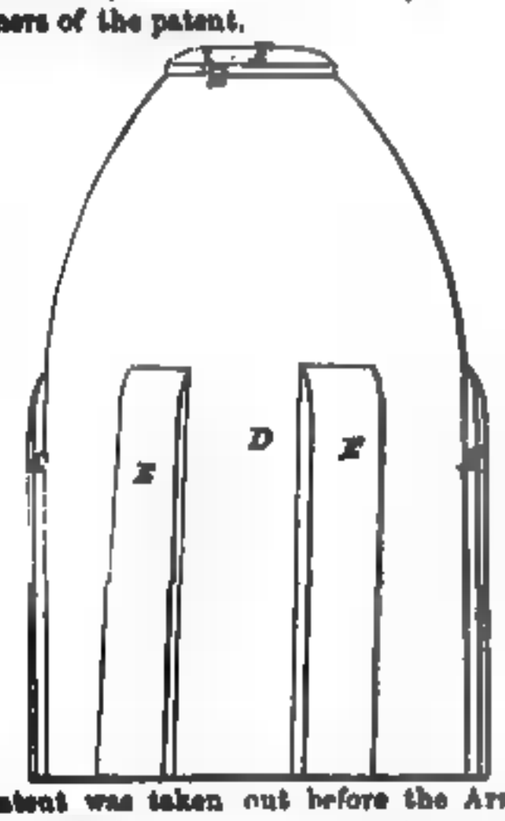
So don't limit your imagination to weaponry. Don't limit your intellect to serving some small segment of our doomed Establishment. A set of **THE SURVIVOR** would take all the limits from your mind. You can not only get your thinking better organized to deal with the coming upheavals but you could plan on being on the ground floor of the next Industrial Revolution.

Scientific American—Aug. 17, 1861

SAWYER'S PROJECTILE

We have published two descriptions of this famous shell, by two of the inventor's rivals, and now we publish his own with a full illustration. ■ will be seen that the description already given was correct as far as it went.

This shell was patented in 1856, by Sylvanus Sawyer, who has since conveyed one undivided half to Addison M. Sawyer. The Messrs. Sawyer are now the sole owners of the patent.



The patent was taken out before the Armstrong gun or the French rifled cannon were known.

The following is a brief synopsis of the Sawyer shell :—It is fired from a rifled, muzzle or breech-loading cannon. The shell is of iron, coated with a peculiar alloy, D D, soft enough to prevent any abrasion of the metal of the gun; and at the same time ■ so compounded as to prevent any *leading* of the gun. Its size, it is so constructed as to slide readily into its place in the gun while the base of the shell, G, being a plane with a beveled edge, *b*, when acted upon by the powder, has so much of the composition upon the bevel upset as is necessary to prevent windage. Thus the whole force of the powder is applied to the propulsion of the shell and all abrasion of the gun, which is observed in the discharge ■ ordinary projectiles, is avoided, and the use of a patch is entirely dispensed with.

The shell, which is elongated and conical at the head, invariably moves point foremost. This result was considered impossible to be attained, until de monstrated by experimental practice with this shell. Upon the point or head, F, ■ a cap or screw-top, *A A*, filled with fulminate or percussion powder, *c c*, which explodes on concussion—by impact with any resisting substance—the alloy, *d d*, forming the point of the shell yields by the blow upon any hard substance, and communicating the fire to the powder within, thus forms the quickest and most certain mode of exploding a shell that has ever been devised.

This shell can be used with the ordinary time fuse; and as a case shot, from its greater capacity, is far superior to any other shell.

Scientific American—June 29, 1861

Care for Soldiers.

In the Crimea, the troops which resisted privations and fatigue most successfully, were those commanded by colonels who were careful of their soldiers. For example: of two regiments which left the camp of St. Omer at the same time, arrived together in the Crimea (in the month of October, 1855), encamped side by side, having submitted to the same atmospheric vicissitudes and performed like service, one of them had preserved, on the 1st of April, 1855, 2,229 soldiers, out of a force of 2,676 men; whilst the other, with a force of 2,827 men, had left to it only 1,239. This account includes those who died from disease, and not from wounds received in battle. ■ the navy the commander of a vessel watches over the composition of the food of the crew, and moreover, respects scrupulously the hour for breakfast and that for dinner; never is it delayed, anticipated or interrupted.

■ ■ desirable that the same scruples should pervade the army, and that these wise measures for the preservation of health should never be infringed without a clear and absolute necessity. Rewards are given to colonels of cavalry in whose squadrons is preserved the greatest number of horses, which results ■ an excellent and profitable emulation. Similar results, but still more important and happy, would be experienced, if like rewards were bestowed upon the colonels whose battalions were distinguished for the healthy condition of the men.

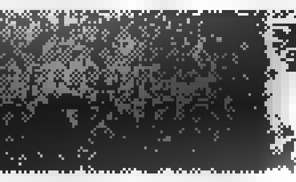
Scientific American—June 22, 1861

HOW PERCUSSION CAPS ARE MADE.

The invention of percussion locks for firearms was as great an improvement upon the flint lock as the latter was upon the old match lock. Its inventor was a pious man devoted to the arts of peace—a Presbyterian minister—whose name and the date of whose patent are recorded on page 340, current volume of the SCIENTIFIC AMERICAN. The percussion powder was [illegible] ventor of percussion caps is alleged to be Joseph Manton, an Englishman, who took out a patent in 1818. His first caps were made of small copper cups charged with percussion powder similar to those still in use. Other parties soon tried to obviate his patent by using small copper discs charged with percussion powder, but these were held to be covered by the patent. The cap was a great improvement upon the loose charge of a pellet of percussion powder placed in the nipple, and all firearms, except those furnished with Maynard's primer, or explosive cartridges, are adapted for percussion caps. An account of the manufacture of percussion caps will be interesting and instructive, especially as no clear description of the operations has hitherto been published, as far as we know.

Percussion caps are formed of a soft copper alloy, which is principally obtained from France in the form of thin sheets. The first operation is cutting these sheets into narrow strips with roller shears. The next is punching out the blank caps, and striking them up in dies in a machine. The strips of copper are fed in between small rollers over a small table which has four dies in it. A punch comes down, and at each stroke cuts out four blanks in a row from the strip. Each blank is formed like a Maltese cross, and just as it is cut out, a small round plunger pin strikes it in the middle, forces it into a small conical die in the table below, and thus forms it into a cap. At the very instant the small die plungers are raised, a puff of wind from a blower throws the four caps out of the dies into a receiving box, and the dies are ready for upsetting another set of blanks. Sufficient copper is left in the strips after punching to enable them to be carried forward to clear the table at each stroke. Different dies are employed for caps of different forms.

The next operation is that of charging and stamping the caps. For this purpose, a strong steel plate containing about 1,000 small conical holes or dies to receive as many formed caps is used; it is laid upon the table of another small machine, a girl takes several handful of caps from the box of the die press, spreads them over the steel plate, and by a few rapid motions of the hand, they all sink into the holes with open mouths, ready for the percussion powder. This is a compound of fulminating mercury, of potash, sulphur, and a little ground glass. This is spread dry and loosely by hand, like meal, over the entire plate, and each cap is filled to the mouth. The surplus is then swept off with a brush from the surface of the plate. Tin foil is now laid upon the top of the plate covering the powder in the caps. A series of small plungers, each of such a size as to fit into a cap, are now forced down upon the charged plate, cutting through the tin foil, and carrying a piece into each cap. The powder is pressed down by these plungers into a very small space at the bottom of each cap, and the pressure is sufficient to stamp the name or number on the top of each, by forcing the metal into



ESE

OWS

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They are good
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. 8. Start the
stock includ-
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release, using
on either side
haper cutter,
ole. Lacking
with a router
ortise for the

ABOUT

...bow	Steel Bow
...s.	4¼ lbs.
...s.	110 lbs.
...ds.	250 yds.
...0 yds.	About 60 yds.
	1¼"
..."	28½"
..."	23"
...3½"	5/16" X 13½"

SHOOT THE...

Modern CROSSB...

IF YOU can't hit the bull's-eye with a ... er's bow and arrow, try one of these ... bows and you'll find yourself hitting the ... every time from distances up to 60 yds. ... for hunting, too; a 160-lb. steel bow will ... short of an elephant. Two models are ... this story, both very similar in constru... that one has a wood bow and the other ... Comparative data is given in table of Fig...

Stock for wood bow: The stock of th... can be made from white pine. Its shape ... like a modern rifle as can be seen in Fig... job by making a full-size drawing of the ... ing the full detail at the trigger as sho... Transfer the stock outline to 1$\frac{1}{16}$-in. wh... saw it out. Drill the hole for the string ... an expansive bit as in Fig. 2. Recesses o... of the hole are run in with a straight s... Fig. 3, the guide collar rubbing the h... shaper equipment, the recesses can be cut ... bit in a drill press. Fig. 4 shows the mo...

Data	Wood ...
Weight of crossbow	3 lb...
Drawing weight	48 lb...
Maximum range	160 y...
Effective target range	About 40...
Penetration in white pine	7/8"
Length of stock	37...
Length of bow	54...
Size of arrow	5/16" X 2...

the proper figure cut in the bottom of each hole. The pressure to which the percussion powder is subjected by this operation is so great, that strangers are always surprised on witnessing it. Sometimes caps explode by the pressure, but as the plates are strong, no damage of any consequence results.

The next operation is that of coating the inside of the caps with varnish to render them waterproof and prevent access of the atmosphere to the powder. For this purpose the plate containing the caps is placed in another machine, which has a series of little dippers, that take up the varnish from a receptacle, and supply each cap with its proper quantity. The plate containing the caps is now removed into a warm room, when the varnish dries, and the caps are then emptied out of the plates, and put up for market. Quite a number of steel die plates are employed in the process, and a set of small machines required for the entire operations of cutting the copper, punching, upsetting, charging and varnishing, will make about 400,000 caps per diem.

We have described the operations from the beginning to the finishing of one set of caps. Several sets of machines are generally run in every percussion cap factory. The demand for such caps has been so great for several weeks past, that the factories have scarcely been able to meet it by working over hours. Some caps are made with top flanges, some are perfectly smooth, and without rims, and others are corrugated. These forms are all produced by the die machine.

Stenches For All

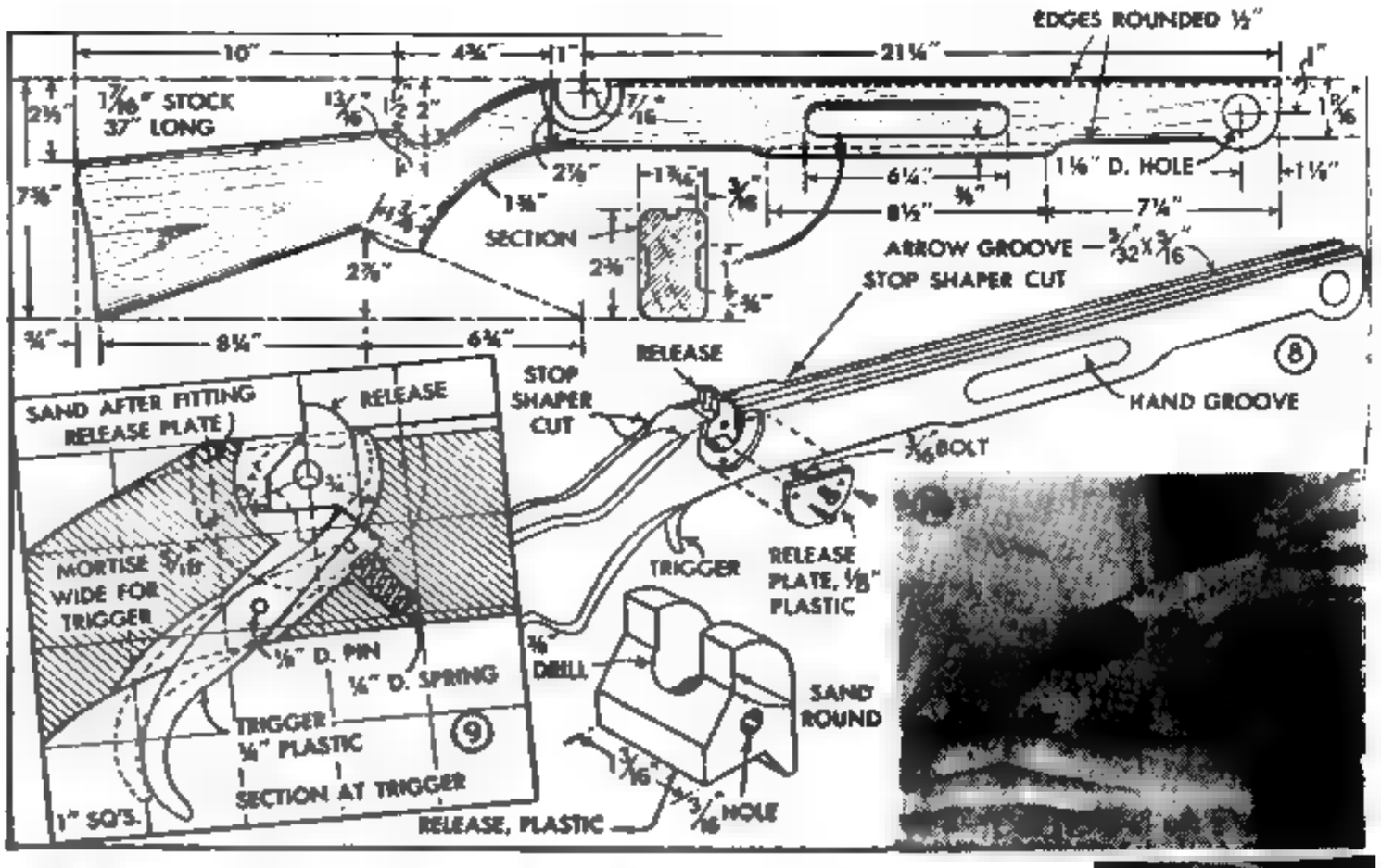
by Kurt Saxon

In these days of fear of offending, people have gotten used to nothing but good smells. So when a stench that can move mountains assails the pampered nostril, the poor baby just can't deal with it. He, she or it must needs go home, or if already at home, move. A good job done on the family or company car gets the vehicle junked.

I once had an experience with Mercaptan, an oil distillate, when a friend threw some into the car of a woman I was staying with. (She had had his child aborted and he had wanted so badly to be a daddy).

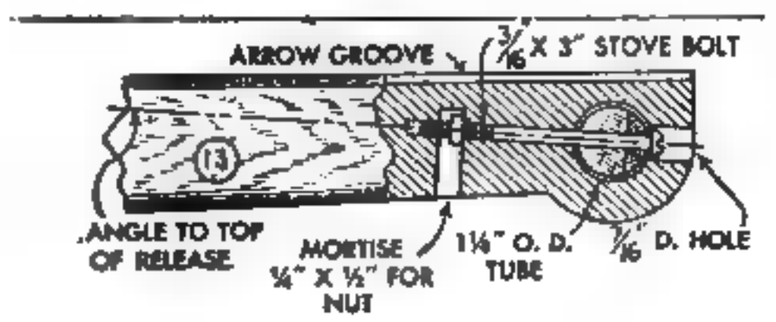
I was awakened by the most horrible odor of garlic and skunks. ■ was hard to trace to its source as it seemed to be all over the house. I finally traced ■ to her car parked outside in the open air. He'd opened the car door, poured about an ounce in the back and closed the door.

Since it was that strong in the house and outside, from a closed car, I wondered ■ the nieghbors would notice. I looked and saw a sheriff's car parked at the curb a full block away. I walked down there and sure



Cocking lever ■ required when bow pulls over 100 pounds. Bows that pull less than this weight can be set by hand

Wood bow is 54 inches long, made from lemonwood. Approximate section for 40, 60 and 80-lb. bows are given in table below. Bow ■ strengthened at center by steel sleeve



trigger being cut. Run in the arrow and hand grooves, using suitable shaper cutters. Then, shape all the edges ½ in. round, stopping about 1 in. from the release hole as indicated in Figs. 6 and 8.

All working parts of the action are made from plastic. Dimensions given will provide sufficient strength for bows up to 60 lbs. drawing weight. Over this weight, the release plates should be 3/16-in. plastic and the trigger should be made from 1/16-in. metal. After fitting the release plates, the top of the stock is sanded down to about the dotted line shown in

enough, the woman had called the law. Naturally, I didn't know a thing, but can you imagine, a full block away?

As soon as I could, I got a pint of it and I don't know of a present source but maybe Aardvark has access ■ it.

The stuff I have is so volatile that the bottle I have is dipped in wax and stored in a paint can stuffed with paper and the ■ banged on tight. Even so, a sniff at the can's edge tells me it's still in there.

I meant to foul a printing corporation in Dallas and hoped to carry it in a wax-dipped hypo. The stench came through the plastic and wax something fierce so I couldn't carry it that way. Then I put it in a 4 cc vaccine bottle with a rubber cap, the kind hypos are filled from. Not good enough. I finally put the bottle in a 4 oz. glass vitamin bottle filled with rubbing alcohol with a tightly screwed-on plastic cap. That's what it took to block the smell.

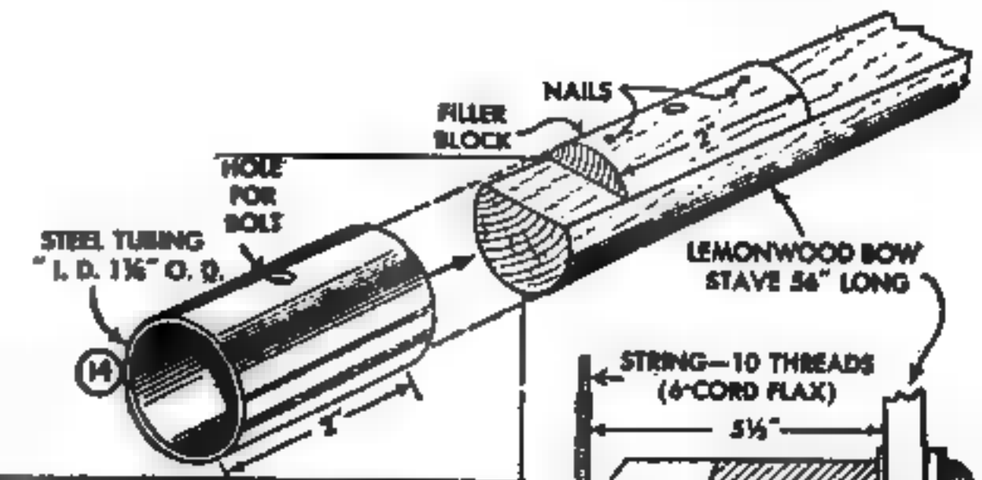
The first stench ■ the smell of rotten eggs. The best way to get the smell of rotten eggs is to rot eggs. Break two eggs in a jar and add an equal volume of urine. The uric acid gives it that special something.

Stir well and leave the jar uncapped for about 24 hours. Then cap and set it in a warm, dark place for a couple of weeks. Actually, it takes a long time for eggs to rot and if the proper bacteria isn't there to settle in it the result could be disappointing.

I had a batch going for a month before it really turned. But when it did it was a horrific wonder. Just a sniff made me gag and that room stank until the next day, even though I'd only had the jar open for a few seconds.

When the stench ■ at its height, the next step is to remove the solids. Cut a piece ■ cotten cloth 12 by 16 inches. Take everything outside, put the cloth across a plate and pour the mess in its middle. Quickly roll the cloth into a loose tube and, holding both ends, twist it until all the fluid has run into a jar. Any fluid on the plate can also be poured in. Dispose of the cloth.

Rotten meat is another really disgusting smell. Put a quarter pound of hamburger in a jar and let ■ set for

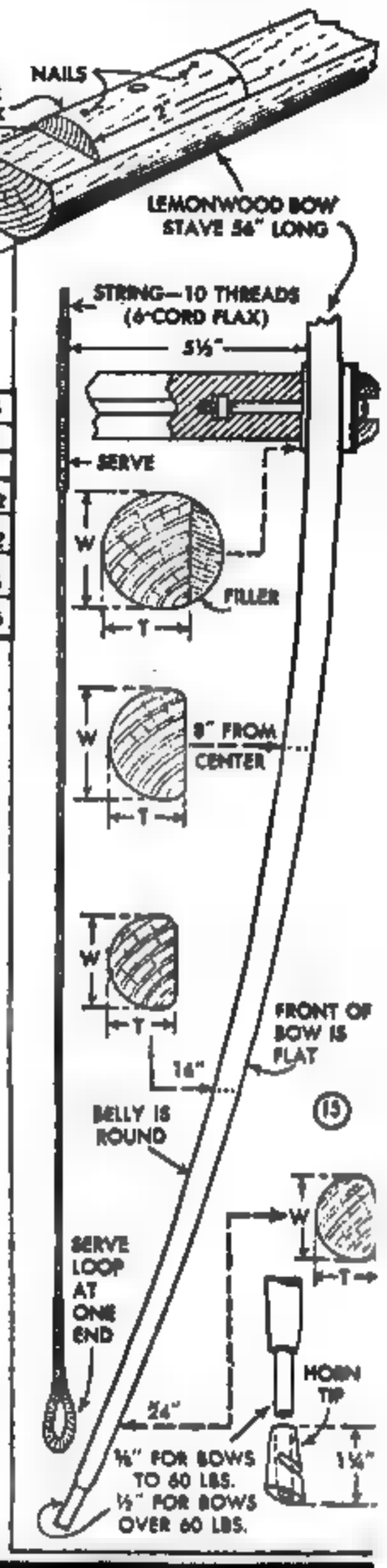


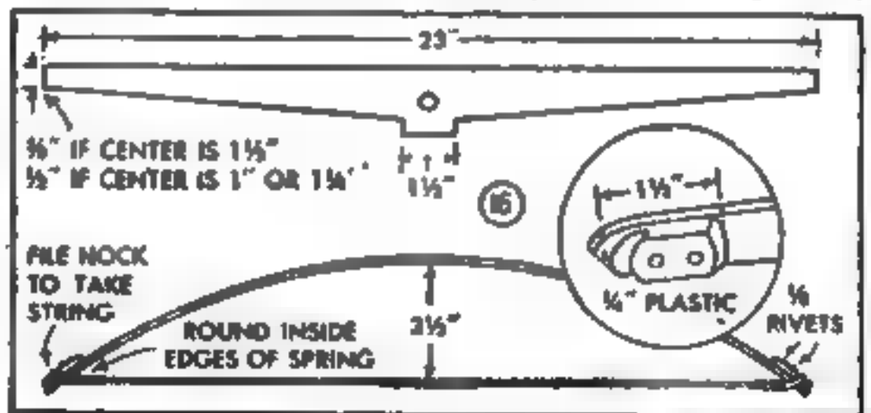
DIMENSIONS OF 54" LEMONWOOD BOWS						
Station	40 Lbs.		60 Lbs.		80 Lbs.	
	W	T	W	T	W	T
Center	1	¼	1	13/16	1 1/16	29/32
8-inch	15/16	21/32	15/16	11/16	1	25/32
16-inch	13/16	9/16	27/32	19/32	29/32	1/16
24-inch	⅝	15/32	11/16	½	¾	9/16

Fig. 9. Fig. 10 shows the operation. The sharp edges are then faired into the shaper cuts. Be careful in fitting the release plates so that screws will not interfere with this sanding and rounding operation, in other words, keep the two top screws low. The plastic trigger has a small lug on the underside near the upper end to fit inside the trigger spring, as can be seen in Fig. 9.

The wood bow: The bow is made of lemonwood to the approximate sections given in the table. The 60-lb. pulling weight ■ recommended. The 80-lb. bow is very close to the maximum stress which can be imposed on lemonwood in this length of bow. Shaping of the bow follows standard practice, flat on the front, round on the belly. A section 2 in. long at the center ■ made full round by adding a filler block, as shown in Fig. 14, this section being enclosed in a steel tube. The completed bow is fitted through the hole at the front of the stock and is fastened with a ⅜-in. bolt as shown in Figs. 11, 12, 13 and 15. Note in Fig. 13, that the bow is tilted slightly so that the string when pulled back comes to about the top of the string release. If desired, the bow can be made by trimming down a regular 6-ft. bow of about 30 lbs. drawing weight. When this is shortened and the ends trimmed down a little, it will pull about 60 lbs. at 21-in. draw. Equally practical, a flat bow can be used instead of the stacked type shown, mounting the bow in a notch cut at the end of the stock. In any case, the bow must be worked carefully and broken in gradually, tugging a little on the string and then releasing until the full draw is obtained.

The steel bow: The steel bow, Fig. 1, does not have the silky, smooth shooting action of a good wood bow, and pound for pound the wood bow will outshoot it. Against this, the steel bow offers compactness and power, and, all





The steel bow is compact and powerful. Metal is obtained from a light automobile spring, which is sawed with high-speed steel hacksaw blade to the shape shown above

24 hours uncovered. Then break it up and cover it with its own volume of water and let it set for a couple of weeks with the lid on tight. Refine the finished product the same way as with the rotten eggs.

The same process goes for fish. Rotting fish will drive anyone up the wall or out into the street.

The fact that these stenches can take several weeks to generate shouldn't bother you. Actual working time is only a few minutes and, considering the small cost and the effect it has, makes it the cheapest wat to emotionally devastate an opponent.

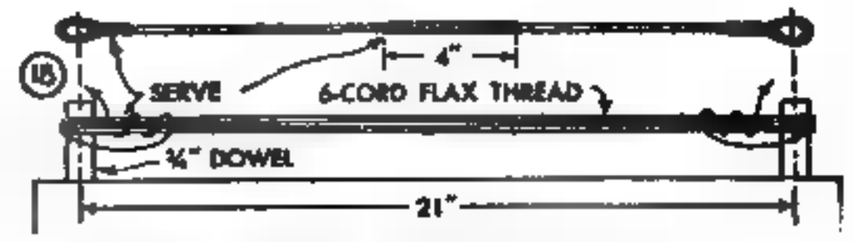
If you mean to dispense the stench with a hypodermic you'll want it to be clear of foreign matter so it doesn't clog the needle. For this you'll need a coffee filter and holder, both of which can be bought from any supermarket for a couple of dollars. Put the filter in the holder over a small jar which will accommodate its opening. Help the filter along by giving its surface as much room as possible between it and the holder. To do this, put toothpicks or straws around the inside of the holder.

Do all this outside and don't let it set there after it's filtered. You don't want the smell to be wasted in the open air.

Aside from just slopping the stench at the target, it's best to use a hypo. This will enable you to squirt it, covering a wider area and with less chance of being noticed. Also, with the inch long needle, you can squirt it into locked buildings through double doors or under the door, into locks, cracks of walls and all sorts of otherwise inaccessable places. Another way is to stick it through backrests of couches, car seats, etc. They have to be burned as there is no way to remove the stench.

If you're going to a bar or theater and anticipate some loudmouthed slob, casually walk behind him and squirt some stench on his back. He'll be forced to leave.

Although hypos are the easiest and least noticeable way to deliver stenches, your stench is worth using, the hypo won't block its odor for more than a few minutes. You'll need a vaccine bottle to carry it around in. These block all but the most volatile stenches such as Mercaptan. In this way, you can carry stenches or poisons

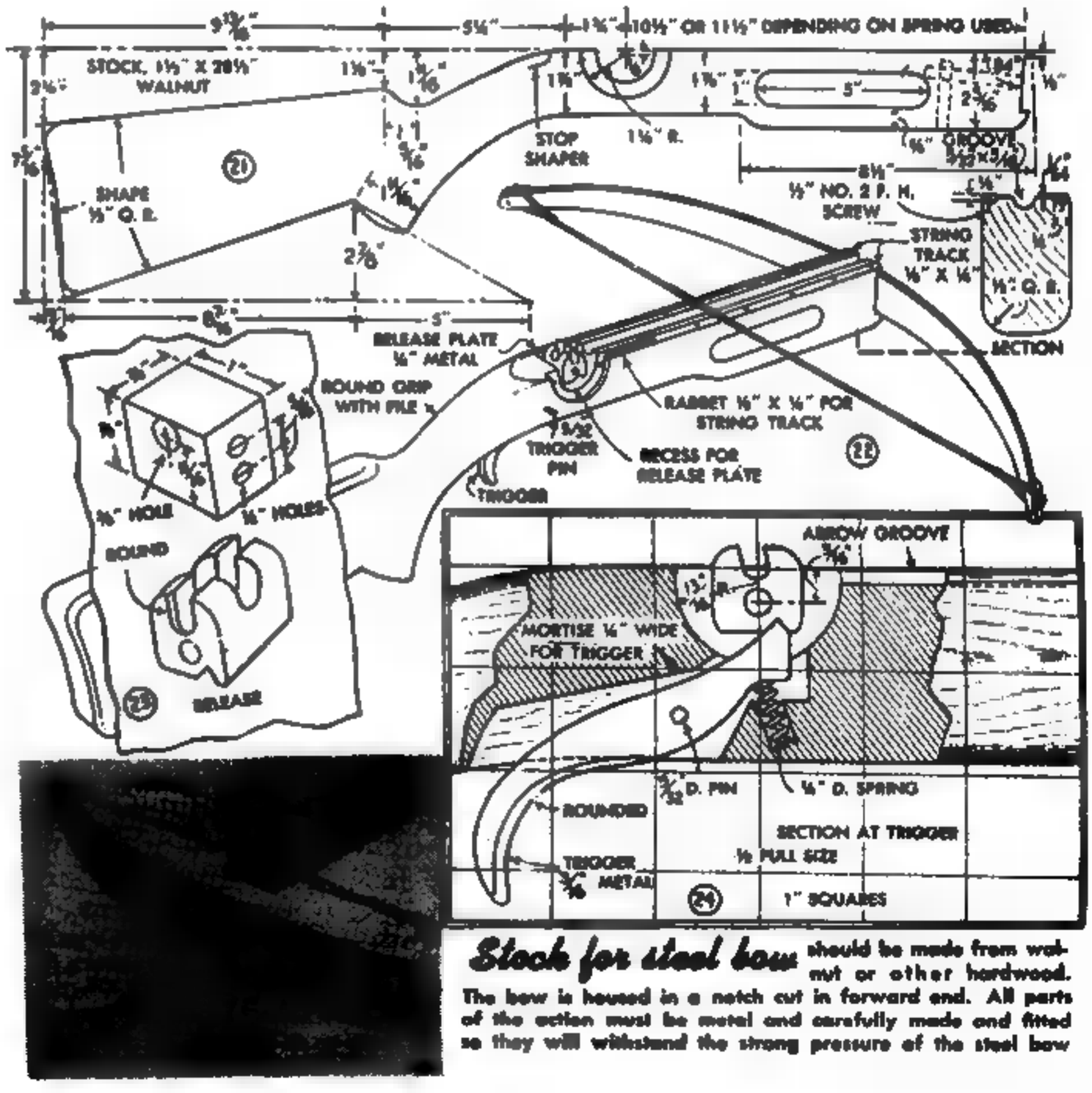


(20) 23-IN. SPRING-STEEL BOWS

Spring Thickness	Initial Set	Brace	Spring to Release	Pull and Threads to Hold 1" Wide	1¼" Wide	1½" Wide
1/8"	About 2¼"	3½"	11½"	42 lbs. /12	52 lbs. /12	63 lbs. /12
9/64"	About 2¼"	3½"	11½"	60 lbs. /12	75 lbs. /16	90 lbs. /18
5/32"	About 2¼"	3½"	11½"	83 lbs. /16	104 lbs. /20	126 lbs. /24
3/16"	About 2¼"	3½"	11½"	142 lbs. /28	179 lbs. /36	216 lbs. /42
7/32"	About 2"	3"	10½"	188 lbs. /36	236 lbs. /48	285 lbs. /54
¼"	About 2"	3"	10½"	289 lbs. /56	363 lbs. /70	438 lbs. /82

things considered, makes much the better crossbow. The spring stock can be obtained from a light automobile leaf spring. It will cost you two high-speed steel hacksaw blades to saw it to shape, Fig. 19. If the spring is a little wider than needed, it is a good idea to leave the extra metal intact at the center, as shown in Fig. 16. The bow tips are cut from sheet plastic, riveted in place and filed to take the string. The steel bow will have an initial fixed set of about 2-in. deflection, and should be braced at 3½-in. deflection as shown in Fig. 16. The table, Fig 20, shows approximately what leaf-spring steel will pull in pounds at 11½-in. draw. A 100 to 160-lb. bow is recommended. Extremely heavy bows over 300 lbs. drawing weight make nice exhibition pieces for flight or penetration shooting, but are no fun to shoot as you seldom retrieve the arrow intact at all. It practical, however, to make two or three bows of different weights, all interchangeable on the same stock.

Bow strings: Bow strings for wood bows can be purchased or made from 6-cord flax thread. This kind of thread is used in stitching machines by shoemakers. Twelve threads will hold wood bows to 80 lbs., the loop at the end being made by turning the whole string back on itself. The string for a 23-in. steel bow is made on a simple wooden form, as shown in Figs. 17 and 18. In this case, the string is divided into equal parts to make the loops. Both loops and a distance of 4 in. at center are wrapped, and the completed string is waxed with beeswax. The string can be shortened by giving it several twists before fitting to the bow. The triangular-boxed figures in table



Stock for steel bow should be made from walnut or other hardwood. The bow is housed in a notch cut in forward end. All parts of the action must be metal and carefully made and fitted so they will withstand the strong pressure of the steel bow

around safely and draw them out with the hypo just before use.

The Scientific American. June 1861

Rifleman's Belt Rest.

A patent has been taken out in England lately by W. R. Taylor, of Oxford, for a peculiar construction of rifleman's belt, to be used as a rest when firing. A strong piece of india rubber is introduced into a part of the belt to render it elastic, and that part of it nearest the left elbow is made slightly wider, and has a small opening in it. When firing, the point of the left elbow rests in the opening of the belt, and the arm which supports the rifle thus exerts a downward strain upon the belt. This, the patentee states, prevents the muzzle being thrown up when the charge explodes, and also gives steadiness to the aim of the marksman.

DON'T BITE THE CARTRIDGE.

In the authorized version of U. S. Infantry Tactics, published by J. B. Lippincott & Co., Philadelphia, the following directions for handling cartridges are given on page 78 :

Take the cartridge in (not between) the thumb and first two fingers, and place the end of it in the teeth. Tear the end of the cartridge down to the powder, then hold it upright," &c.

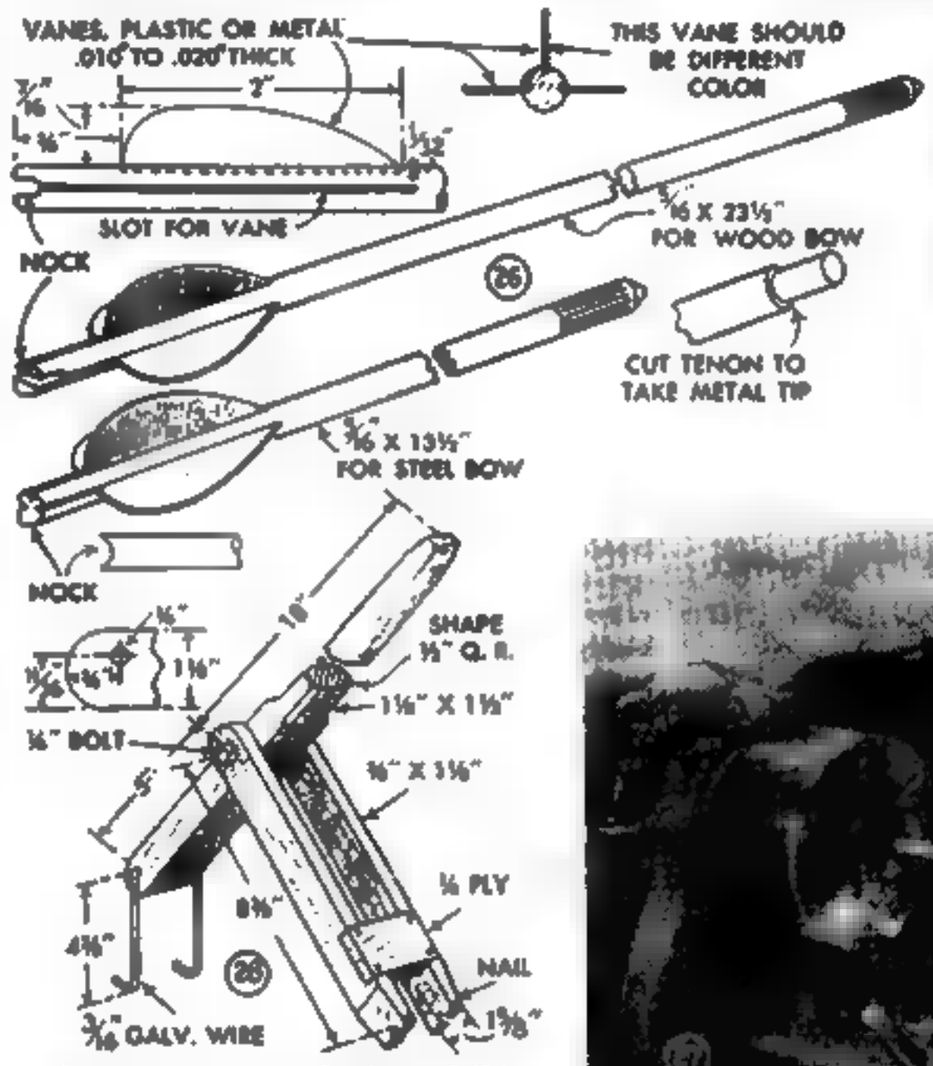
This is one of the multitudinous and unscientific movements still retained in our military tactics. A man may be young, sound in limb, strong of arm, quick of foot, keen of eye, and a first rate shot, but if he has had the misfortune to lose his front teeth by a kick or fall, the fellow, however patriotic, cannot be admitted into Uncle Sam's army, and all because ■ cannot bite the cartridge with his absent teeth.

■ ■ well known to all soldiers that the tearing of cartridges with the teeth in battle soon causes an almost intolerable thirst. It is one of the least agreeable operations to a soldier to bite a cartridge, especially if it is lubricated with grease, and we are astonished that military men should still cling with such conservative leadenheadedness to the practice when a very superior mode is known. By filing the upper edge of the handle of a fixed bayonet until it is made quite sharp, the soldier, instead of being required ■ bite his cartridge, can rip it open neatly and rapidly, by drawing its end upon the edge of the bayonet handle. All the bayonets used in the army should be filed as suggested ; the expense would not be over one cent for each, while the improvement would ■ of incalculable value if introduced into the army.

Fig. 20 are the number of threads of 6-cord flax required to hold a bow of the drawing weight indicated. Stepping on the center of the bow while the ends are supported on wood blocks will bend the bow enough to permit slipping the string in place.

Stock for steel bow: Because of the heavier drawing weight, the stock for a steel bow must be made from walnut or other hard, strong wood. The stock should be laid out full-size, Figs. 21 and 24, then transferred to wood, cut out, and then machined in much the same manner as the wood-bow stock already described. An addition is the metal track on each side of forearm, Fig. 22. This originally was to protect the wood from the rubbing action of a metal bow string. The metal string (6-strand, 19-wire flexible cable 5/32-in. dia.) did not stand up under actual shooting and was discarded for the flax thread. The track, however, is worthwhile protection even with the flax string, although not essential. All parts of the action are metal, steel for the release, Fig. 23, and trigger, and aluminum or brass for release plates and string track. The bow is housed in a notch cut in the end of the stock, and is held by means of three locating pins and a bolt, as shown in Fig. 25. The carriage bolt is ground round under the head, which is sawed to form a screwdriver slot. The release pin is ¼-in. diameter, slotted on one end for a screwdriver and threaded on other end to fit a tapped hole in the release plate. All metal parts are of ample strength for bows up to 400 lbs. drawing weight. Follow the release and trigger design closely; these parts are nicely balanced to provide positive holding while retaining a light trigger pull.

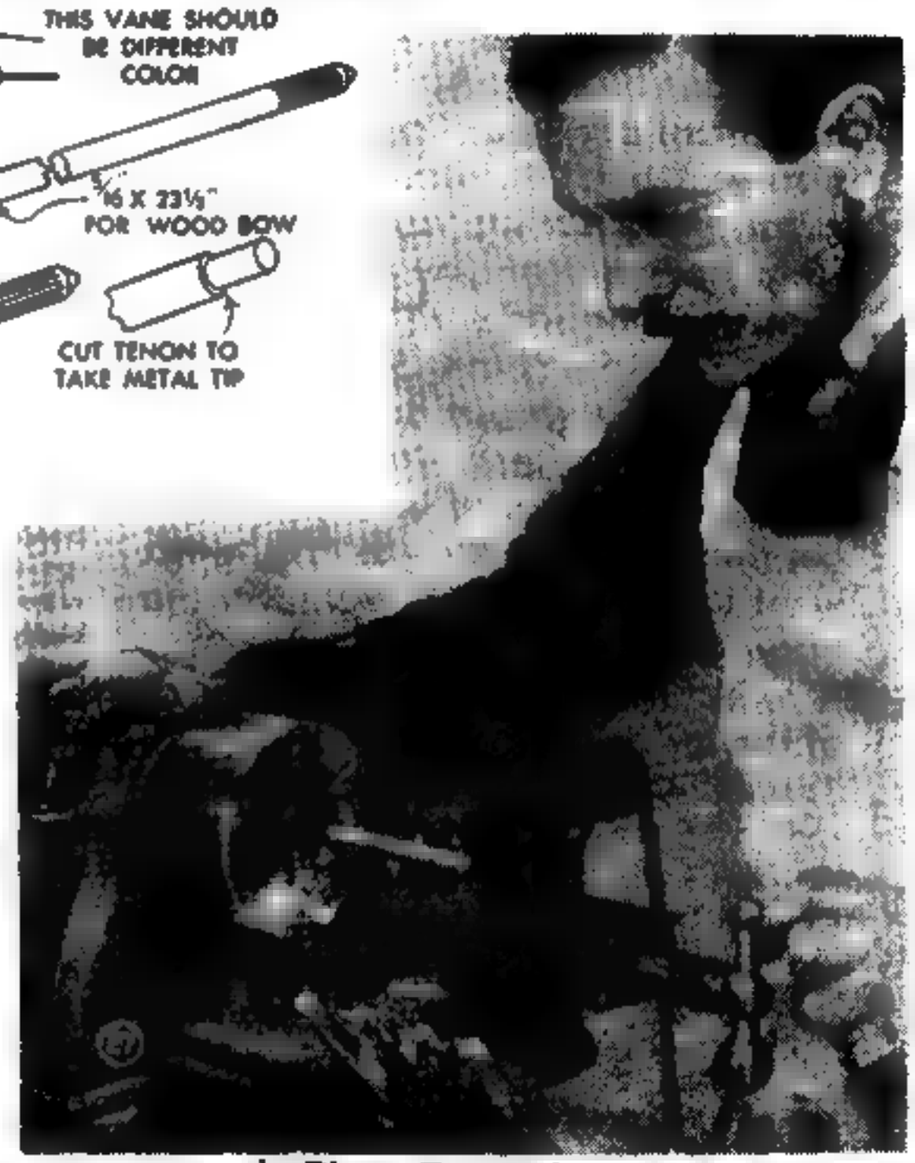
Arrows: Arrows for both bows are 5/16-in. birch dowel. Vanes are plastic, celluloid or metal, glued in grooves cut in the shaft.



Arrows are made from 5/16-inch birch dowel. The vanes are cut from celluloid and are fitted in the grooves cut in the shaft

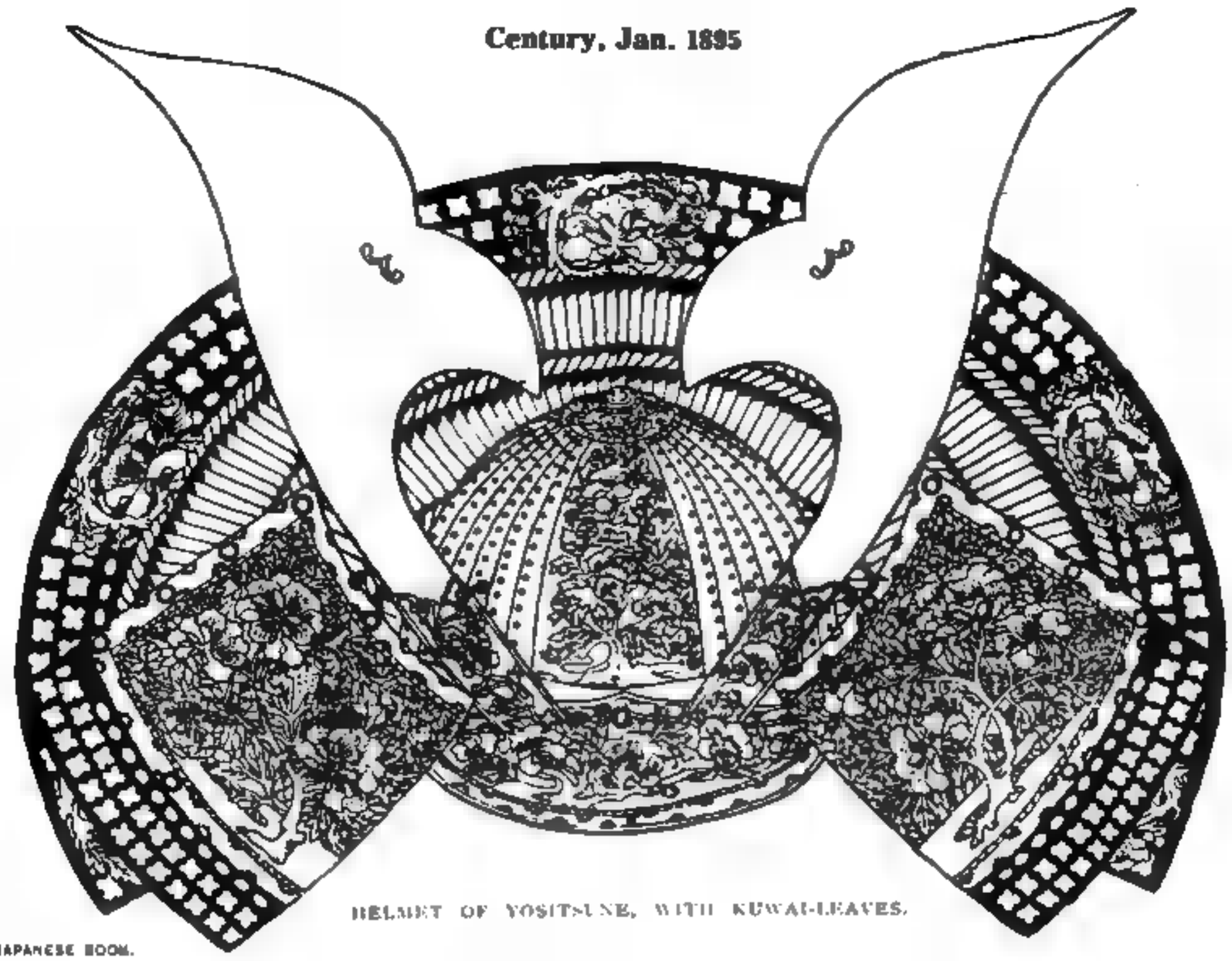
Fig. 27 shows one way of cutting the grooves, the shaft being held in the lathe, positioned by the indexing head, while a rotary hand tool mounted in a slide rest does the cutting. Vanes are mounted at right angles, Fig. 26, instead of the usual triangular pattern used for long bow arrows. This method of mounting provides perfect ruddering for smooth, straight flight and, at the same time, fits the mechanical construction of the crossbow.

Cocking lever: Bows up to about 100 lbs. drawing weight can be set by hand; over this weight it is necessary to use a cocking lever. Fig. 28 shows the construction and dimensions of a cocking lever for 11½-in. draw. The galvanized-wire hook which slips under the bow will automatically assume a bent position the first time it is used. Photo Fig. 7 shows the manner of using the lever. If the release is set slightly forward, the trigger will cock automatically when the string engages the rear prong of the release.



Shooting: After cocking the bow, the cross bow is shot very much like a shotgun, sighting down the arrow to the target. A little practice will enable you to judge the range and drop of an arrow very nicely. When hunting, the bow can be carried cocked but without arrow. When not in use, the steel bow is left braced, but the wood bow is unstrung. Needless to say, any bow over 100 lbs. packs a terrific drive, and the utmost caution should be exercised in its use. Never fit an arrow in place until you are ready to shoot, and don't point the gun in any other direction than toward the target when the arrow is in place.

Century, Jan. 1895



HELMET OF YOSITSUNE, WITH KUWAI-LEAVES.

FROM AN OLD JAPANESE BOOK.

THE ARMOR OF OLD JAPAN.

With illustrations from "Precious Jewel Records of Military Usage," Japan, 1694.

HELMET OF YOSITSUNÉ, WITH "SKY-PIERCER." 1183 A. D.

OF the art of Japan, as shown in the wonderful warimplements of her great military leaders of old, the daimios, and of their vassals, the samurai, few of us have any but the vaguest of knowledge. A few suits of curious armor in the museums of our large cities, a few swords,— the long one for despatching one's enemies, the short one for despatching one's self, according to the code of honor among the Japanese,— give us the merest hint of the admirable defenses and weapons which were produced by this energetic and intellectual race during ages of warfare.

In Memorial Hall in Fairmount Park, Philadelphia, is a small but very interesting collection of the weapons and armor of old Japan. These wars lasted until three hundred years ago, when the long peace set in. To this peace we are indebted, perhaps, for the best of the art we now enjoy, except in this one branch — metal-work. For this, warfare was the great stimulus, and the metal-worker of twelve hundred years ago, in the opinion of so good a judge as Anderson, "had little to learn in mastery of materials or tools."

The collection was brought to this country a few years ago by Tatsui Baba, a young samurai belonging to the patriotic party, and well known throughout Japan as an able writer and a leader in public affairs. He had made a special study of the ancient armor of his native land. The results of his researches he gave in the form of lectures before the learned societies of our large cities. After his death in 1888 his cherished curios were secured by the Pennsylvania Museum and School of Industrial Art, whose collections are housed in Memorial Hall.

The most striking things to a casual observer are the three curious suits of war-harness, examples of that worn in Japan during the third,[1] fourteenth, and sixteenth centuries. This must not be classed with the armor we see in almost every curiosity-shop abroad, which is of much later date, belonging in many cases to a soldier of our own day.

As with other nations, the war-harness of rawhide, called in Japan "shell" ar-

BATON.

DRAWN BY OTTO H. BACHER.

FROM A SPECIMEN IN MEMORIAL HALL, PHILADELPHIA.

mor, came first, and lasted down into the ninth century. This was the time of Charlemagne and his leather-clad knights, when, in Europe, "every man wished two things: first, not to be killed, and, next, to have a good leathern coat." Tunics were of plaited leather; and coats, hoods, breeches, and shoes were made almost entirely of this material; and while the coats, it is true, had plates of iron riveted upon them, the casques alone were of steel.

DRAWN BY OTTO H. BACHER, FROM A SPECIMEN IN MEMORIAL HALL, PHILADELPHIA.

THIRD-CENTURY ARMOR.

The iron-and-lacquer war-harness of Prince Shotoku, the great apostle of Buddhism, may still be seen in the old temple of Horiuji in the province of Yamato. It was worn about 586 A. D., and is the earliest specimen of Japanese armor in the possession of the nation. A picture of the prince in his elaborate court dress, drawn by himself, as the Japanese declare, is kept in the temple of Tennoji in Osaka, along with his "sword of seven stars." On the blade of this sword shine the seven stars which rule human destiny, and the dragon, symbol of his mission as defender of the faith of Buddha. It was to his neighbors the Koreans, most likely, that Prince Shotoku owed his fine war dress; for their craftsmen came over the sea to Japan during his time, bringing with them a knowledge of metals and of art superior at the time to that of the islanders. Indeed, the Japanese of the present day prefer to their own truly artistic work their heirlooms of old Korean and Chinese make, which in our eyes are often far from beautiful.

Of the three suits of armor in Memorial Hall that attributed to the third century is the most richly decorated. A description of this suit will answer, with few exceptions, for all three; for in that fortunate land the fashions did not change, but descended unaltered for generations from soldier-father to soldier-son.

The cuirass is called the "breast-binder," and is made of leather, on which are fastened thin plates of well-tempered steel covered with polished black lacquer. The lower edge of one row of plates is covered by the upper edge of the row beneath, in window-shutter fashion. The little plates are fastened together with stout silk braid in several shades of purple. There is such a profusion of this braid that it gives a decided hue, and a name, to the whole suit. The Mikado himself, should he appear on the field of battle, would wear the "armor of shaded purple," and his bow-gloves would be dyed in the same royal color. To this cuirass are fastened the half-dozen separate tassets which hang from the waist nearly to the knees. They are made, like the cuirass, of narrow, upright steel plates bound together with the same purple braid. Underneath them is worn a sort of divided skirt of yellow brocade, stout and heavy, and on this are fastened the two pieces of plate-armor which guard the lower thighs.

The sleeves are of the same strong yellow brocade, covered partly with chain-armor, partly with plates of iron overlaid with brass. The brass is openwork, with a charming design of plum-blossoms, the round elbow-guards being specially attractive.

The war-chief who owned the original of this harness fought on horseback, for his long leg-guards are entirely of iron, carefully modeled to the shapely leg of the wearer, and covered with brilliant black lacquer. Gilded butterfly-clasps join the three upright strips, ten butterflies in all, and every one different. For his retainers, the fighting footmen, locomotion was made easy by having side-pieces of pliant leather set into their leg-guards.

The iron helmet, studded closely with little iron points, is a fine piece of workmanship. The brazen horns stand bravely up in front, looking, with their central ornament, like a pitchfork or a trident. The broad iron flaps which

[1] So attributed, but probably belonging to the sixth or seventh century.

turn back to guard the temples are covered with leather dyed in plum-blossom pattern, and have on them the badge of the chief, a single kiri-leaf. The daimio, though king of his own domain, must never dare to assume the triple kiri-leaf, a symbol forbidden to all but the Mikado himself.

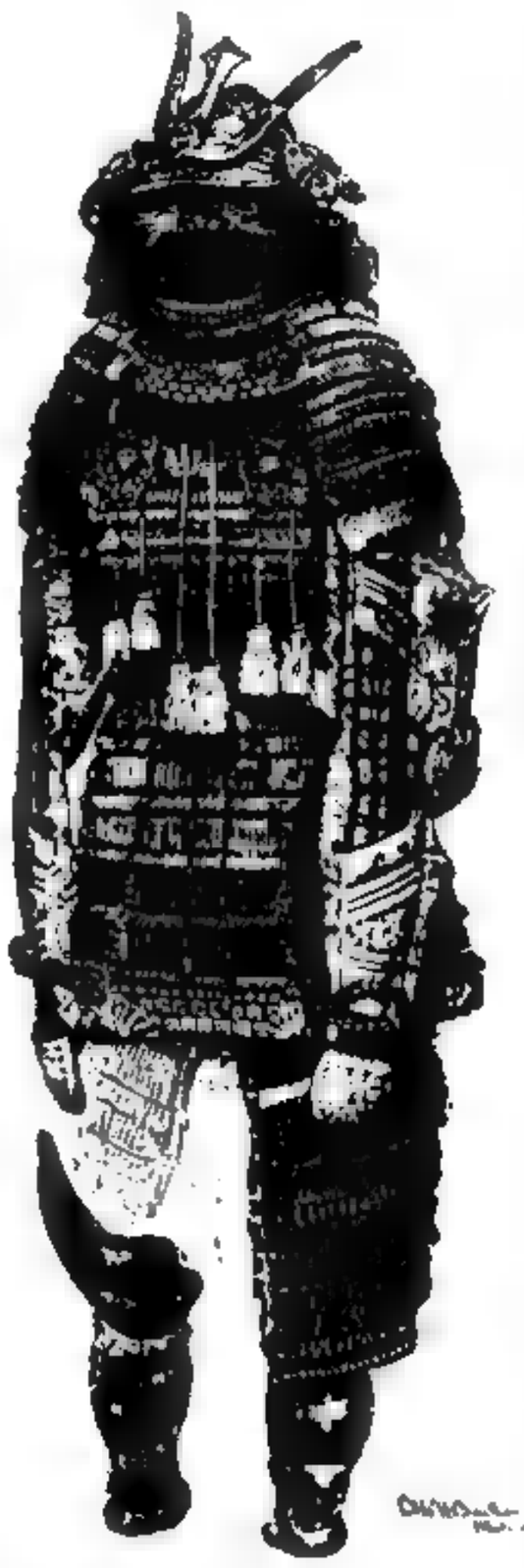
In the iron face-guard, nose, chin, and ears all come in for the kindly consideration of the modeler. The mouth and nostrils have shapely breathing-holes, while underneath the chin is a row of little "ventilators." Such charming devices for comfort were unconsidered and unknown among the European armorers of that early time. To make all secure, throat and neck were covered with a sort of beard of plates hanging down from the face-guard. Even the very oldest helmets have an air-hole at the top, usually forming the center of a silver chrysanthemum. The ancient Japanese metal-workers, with their race passion for decoration, turned even a ventilator into a thing of beauty.

The daimios of those old times had three favorite ornaments for their helmet-fronts, and seldom cared to vary them. The one most familiar to us in art was two huge leaves of a very decorative Japanese water-plant, the kuwai. These, made of chased brass, and often covered with silver and gold, stood up in front of the helmet, one turning to the right, the other to the left. Next in favor came the "sky-piercer," much like the first except that the two kuwai-leaves scraped the sky even more defiantly. The third was the crescent. The horns (representing courage) in the early armor we have just described were also in high repute among the chiefs.

In later days the smiths used their ingenuity in inventing every kind of curious and grotesque helmet shape and adornment, bringing into service all manner of queer shells and fishes, birds and beasts, monsters and devils. Waving tongues of flame, skilfully reproduced in metal, often glistened over the heads of the great commanders.

The twelfth-century armor of Yositsuné, Japan's most famous hero, is carefully guarded in the Temple of Rising Happiness (Kofuku-ji) in the ancient town of Nara. His helmet is there, with chasings of silver and gold, with flaring kuwai-leaf plume and so-called "lion" crest. The Japanese had probably never seen a lion with their own eyes; they used the eyes of the Chinese, and between the two pairs of oblique orbs the king of beasts became a pitiable distortion. The Japanese name for this conglomerate is "foreign lion." On the breast-plate three of the same extraordinary beasts, with tufts on their tails and rosettes on their legs (like the prevailing fashion in black poodles), are snarling at one another among the imperial gold and silver chrysanthemums.

There was a special decree as to the manner in which the warrior of these middle centuries should put on his elaborate armor: a sequence modeled after the fashion or fancy of no less a personage than Yosi-iyé, head of the Minamoto family in 1057.



DRAWN BY OTTO H. BACHER, FROM A SPECIMEN IN MEMORIAL HALL, PHILADELPHIA.

FOURTEENTH-CENTURY ARMOR.

Right leg left without the armor-guard to show shape of piece for lower leg.

First he must swathe himself in a long and voluminous garment of yellow cotton, and a pair of equally voluminous white cotton trousers. His long hair, to keep it out of his eyes, should then be tucked up under a peaked cap of leather, which saved the head from the helmet's pressure. Next he must strap on his bow-gloves. After that came a second coat and trousers, a sort of undress uniform, preparatory to the armor proper; then the leg-guards, the bear-skin shoes, and the sleeves of mail. Lastly, the suit of armor, with its helmet, was tightened on with the long silken rolls or tubes that answer to our leather straps; the final touches, in the shape of sword and dagger, "arrow-cage" and arrows, bow and banner, were added — with groans, one would fancy; and this strange warrior was ready to strike terror into the souls of the enemy.

A set of colored prints from Japan shows the daimio in process of putting on these articles, each in its proper order. The attitudes are striking, one in particular, after he has put on his clumsy bow-gloves, and is struggling to tie his bearskin shoes. Of these shoes there is a pair in the collection, with black leather soles stamped with chrysanthemums, and black bear-skin uppers with the shaggy hair outside, a shapeless but comfortable foot-gear. The ancient buckskin bow-gloves, too, are here, consisting chiefly of a very fat wadded thumb and two fingers for the right hand and a solitary thumb for the left.

The obvious awkwardness of the order in which these warriors of the middle ages were forced to array themselves was probably due

merely to the personal fancy of a great leader like Yosi-iye, but was copied so faithfully by his conservative followers that the tradition, after lasting simply as a tradition for nearly three hundred years, crystallized in 1331 into an actual code.

The fourteenth-century armor in the museum is much plainer than the suit just described. It has the "round" cuirass, the whole effect of which is red, owing to the profusion of red silk braid used for binding the plates together. The old Japanese braid was not like most of ours, half cotton or linen: it was pure silk, of the toughest and most enduring character, plaited in a way which secured the highest degree of resistance. The Japanese much preferred it, for most uses, to thongs of leather.

The daimio who wore the original of this armor had a fancy for a crescent between the two great water-leaves of his helmet, and a weakness for his chosen device or ancestral crest, which is on every part of the suit where a device could possibly be placed — on cuirass, hand-guards, thigh-guards, and, above all, on his helmet, where it appears on the little upright ears that take the place of the temple-flaps, and also on the front of the helmet, below an archaic Japanese character meaning "warrior" or "military man." This badge or device is the Buddhist symbol for ten thousand.

The ordinary wooden bucket of Japan gives name and shape to the "bucket" cuirass of the sixteenth-century armor. Its helmet shows the later and rather startling taste of the armorers or their masters. Instead of the brazen spade, crescent, or water-leaf, simple and decorative, that had shone for centuries over the heads of the daimios, they must now make themselves frightful with monsters. Here we have the grinning head of a devil, with glass eyes and great hooked teeth, pointed ears, and long, curving, gilded horns. Flowing locks of gray horsehair stream down on each side of this grisly countenance, and a huge gray horsehair mop takes the place of the fine old lion or dragon crest of the earlier chiefs.

The heart of the modern devotee of "high art" in fabrics would be gladdened by the design of the heavy brocade on which the iron defenses for the sleeves and lower thighs of this sixteenth-century armor are fastened; where, through a background of softest gray-and-silver clouds, the imperial dragon is drawing the coils of its vaporous body. The same stiff brocade forms part of the side-piece of the work of art with which the armorer protected the legs of his feudal lord, the original owner of this suit. The leg-guard is, as always, of lacquered iron, but its lower side-piece is of stout buckskin dyed in brown, leaving in white a few dragon-flies scattered over the surface. The wadded knee-piece is of snowy buckskin quilted in hexagons, each with a "cross-knot" of red silk braid in the center.

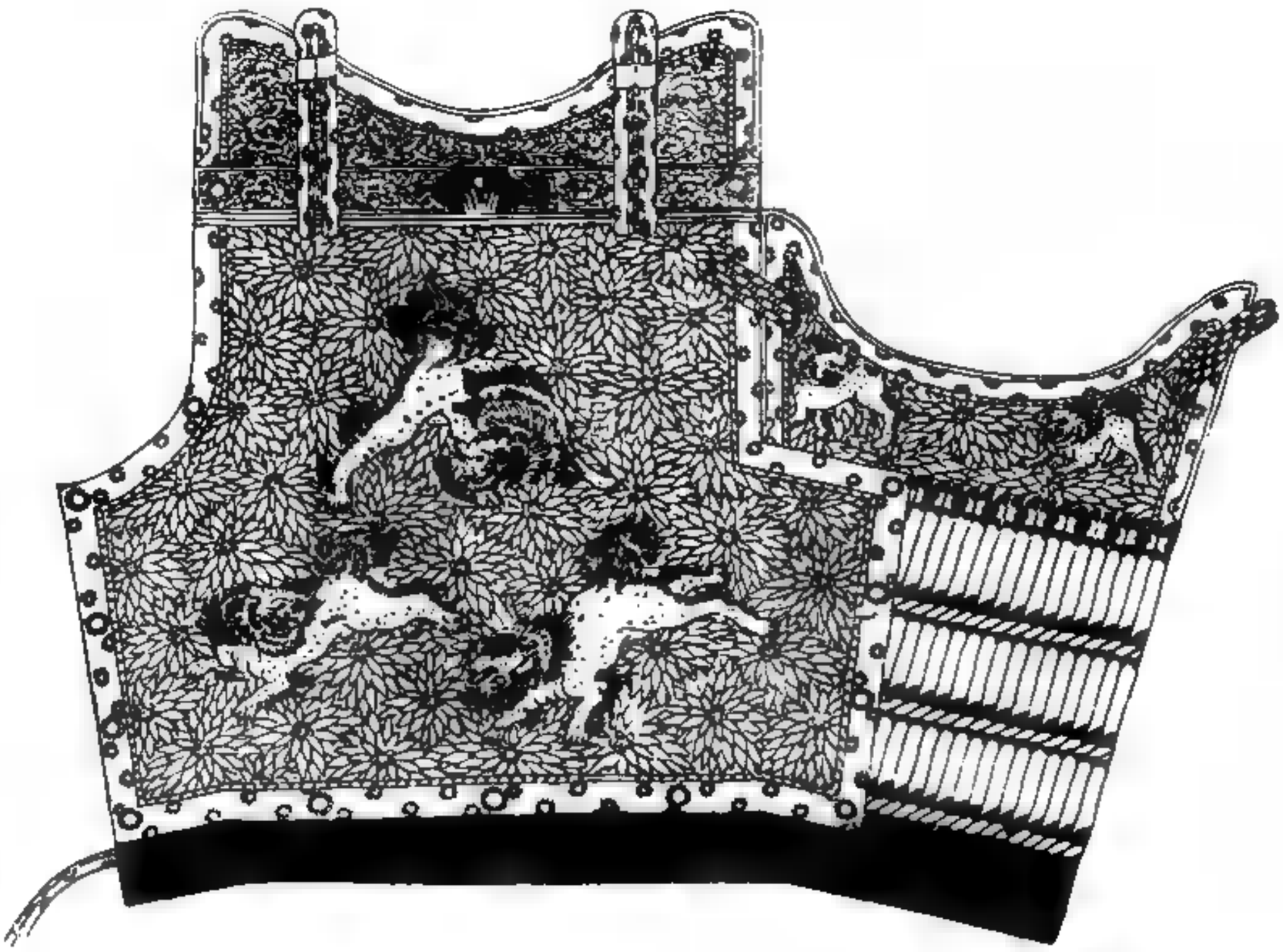
By the side of these, though not in the same collection, is a suit of armor worn about three hundred years ago by the Prince of Tchui. It was selected by the governor of Kioto for a recent American consul, as a fine specimen of the old lacquer-work. The cuirass is lacquered both inside and out, the outside being solidly gilt. The helmet-crest is a red disk, upon which one may dimly discern a golden lotus-blossom.

The small silken flag or banner on which the ancestral blazon or the device chosen by the warrior himself was painted, embroidered, or woven, was often carried on his own back. This strikes one as an economical and clever arrangement: it saved the banner-bearer's daily wage of rice, and one's colors were always on the spot at the critical moment. The daimio of those stirring days was entirely independent in this respect: his banner-staff was slipped through a hinged eye at the top of his cuirass-back, its pointed end fitting into a socket at the waist. Two of the suits of armor brought from Japan by Tatsui Baba have this eye-and-socket arrangement.

The blazon, like those of the knights of other nations, was chosen to keep in remembrance some feat of arms performed by the warrior. Should he be so happy as with some favorite "cut" to slice off the heads of three of his enemies in battle, he would be apt to choose for a family coat the three severed heads. We can fancy him, armed cap-a-pie, urging his small, shaggy charger into the fray, with the triple-headed banner waving over his shoulder.

Other emblems worn in the same way were made in the shape of fans and temple-bells, butterflies and stag-horns, as in the head-piece.

From the twelfth to the seventeenth centuries the fighting was frequent and fierce, and the



FROM AN OLD JAPANESE BOOK.
BREASTPLATE OF YOSITSUNÉ, WITH THE IMPERIAL LIONS AND CHRYSANTHEMUMS. 1185 A. D.

armor more protective. Out of the "three articles"—helmet, breastplate, and sleeves—which we read of in the ancient Japanese records had been gradually evolved the "six articles": a metal covering for face, legs, and thighs gave a man a better chance for his life against the rapid cuts of those wonderful blades, or the quick spear-thrusts delivered by the short but sturdy knights and their retainers. The more we study this armor the more admirably does it seem adapted for a defense against the special weapons opposed to it. These were seldom the heavy hammers and great crushing battle-axes of the Europeans, or, later, their bolts and bullets. They were chiefly arrows, spears, and halberds, swords and daggers; but these were unrivaled in metal and make, and were wielded with extraordinary skill.

The Japanese armorers, from the earliest centuries, united in their war-harness such flexibility and lightness, efficiency and comfort, together with beauty of workmanship and decoration, as were rare among their craft in Europe. Using the invaluable and universal leather as a foundation, they covered it, as did the Europeans, with plates of iron or steel.

But instead of compelling their lord and his retainers to waste time and strength in keeping their war-gear rust-free and glistening, they simply covered these plates with their wonderful lacquer. Lacquer added little weight to the metal plates beneath it; no burnishing was needed upon its glossy surface, the rounded form of which often served to turn the enemy's sharpest arrow or keenest sword-blade. Above all, the destroying devil of rust was annihilated. According to the old chronicles of the knights of Europe, as much muscular force was wasted in furbishing up their armor as would have beaten the enemy twice over.

To illustrate the conservatism of the Japanese in their armor, we quote a native account of a fight which occurred in the streets of the capital Kioto as late as 1864, between the troops of the shogun, who had possession of the person of the emperor, and the forces of the "irregulars," who were clamoring for the expulsion of all foreigners.

> The Choshiu troops [irregulars] were defended by armor, their leader clad in a suit of armor tied with grass-green silken strings, and covered with a garment of Yamato brocade. Over this he wore a surcoat of white gauze, with figures drawn on it in black. He bestrode a charger, a baton of gold paper in his hand. Before him went flags and banners and two field-pieces, with a company of thirty spearmen. The spears, crossing each other, looked like a hedge of bamboo-grass; bullets flew overhead like axletrees. Helmets and cuirasses that had been cast away by their owners, spears, pikes, bows, and muskets, were lying about in quantities.

Another leader was

DRAWN BY OTTO H. BACHER, FROM A SPECIMEN IN MEMORIAL HALL, PHILADELPHIA.
SIXTEENTH-CENTURY ARMOR.

mounted on horseback, and held a baton of white paper in his hand. He wore a mantle of scarlet embroidered with his crest, the trefoil, and under it a suit of armor adorned with purple fastenings. His head-covering was a warrior's cap of bronzed leather.

These batons, a very early symbol of authority in Japan, were wielded with vigor by the daimios. The one in this collection is a short wooden rod or wand covered with black lacquer and mounted in silver. At one end is a huge plume of the tough Japanese paper, silvered; and at the other, cord and tassels of heavy red silk braid. When not waving wildly in command, it hung by its cord to a ring on the breastplate.

The daimio, with his Tatar cockade and his overbearing ways, is now perhaps picking tea or binding rice. The samurai, with his two swords and his swagger, taxes the country no more. The beautiful swords have degenerated into curios. The modern army of Japan, modeled on European lines, equipped with the latest European firearms, admirably organized and disciplined, owes, nevertheless, much of its brave spirit to its iron-and-lacquer warriors of centuries ago.

DRAWN BY OTTO H. BACHER, FROM SPECIMENS IN MEMORIAL HALL, PHILADELPHIA.

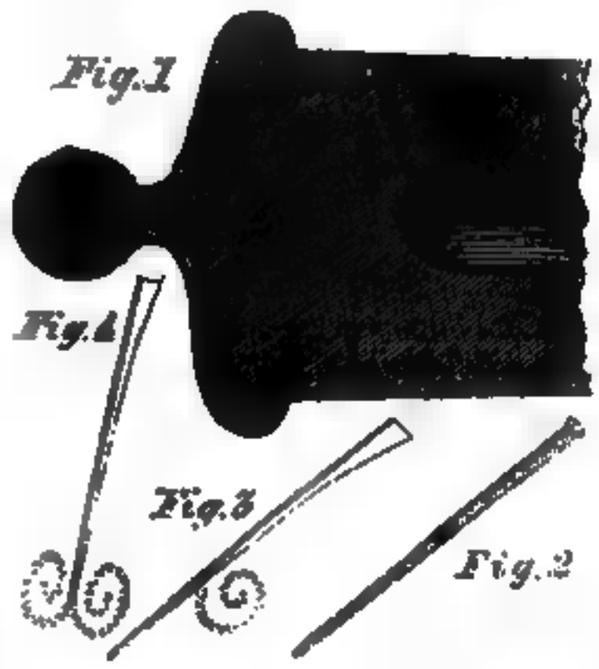
Sixteenth Century. Fourteenth Century.

LEG-ARMOR WITH BEARSKIN SHOE.

M. S. Hunter.

Mode of Spiking Cannon.
The Scientific American — June 18, 1861

From the number of inquiries which which have been put to us since Colonel Anderson spiked the cannon at Charleston, as to the way "spiking" is done, we are led to believe that a large majority of persons are ignorant of the process. To enlighten such, we have had the annexed views engraved to illustrate the plans most usually adopted. Fig. 1



represents a longitudinal section of a cannon, with its priming hole spiked with a small rat-tail file, as shown in Fig. 2. The steel is driven hard down, as far as it can go, and then broken off even with the surface of the barrel. The steel ■ so hard that it cannot be drilled, and so rough that it cannot be forced out, and is, therefore, the best material used. Figs. ■ and 4 show two forms of wrought iron spikes, which assume the position shown by the dotted lines when used, and thus cannot be withdrawn without much difficulty.

These three weapons must have been proved out by prototype as well as theory. What became of them? Does anybody know for sure?

ELECTRIC MACHINE GUN IS SILENT

Electric antiaircraft machine gun. Electromagnets hurl bullets

ELECTRICITY replaces gunpowder in a silent, smokeless, machine gun recently perfected for defense against hostile aircraft. Without betraying its location, this weapon is declared capable of firing 150 bullets or high-explosive shells a minute. Projectiles are hurled from its muzzle by a series of electromagnets spaced along the barrel, which start the missile moving and successively raise its velocity as they become energized.

Popular Science Monthly — September 1935

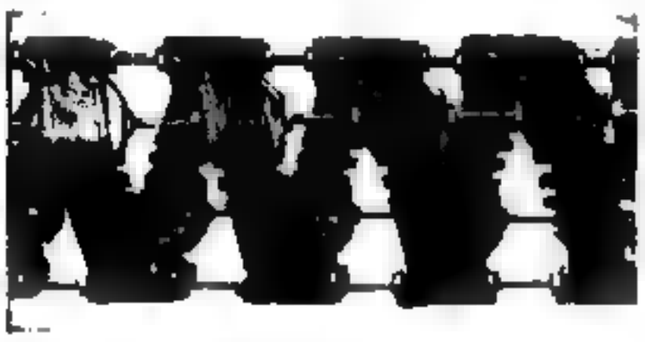
"KICKLESS" MYSTERY GUN IS TESTED BY ARMY

A NEW "kickless" mystery gun undergoing Army and Navy tests is reported to hurl one-pound, high-explosive shells at the rate of 150 a minute. Recoil is so slight, it is said, that water will not spill from a glass balanced on the barrel during fire. Each shell contains a charge powerful enough to shatter an armored tank or to demolish the wing of a heavy bombing airplane.

This gun is said to hurl 150 one-pound shells a minute, with little recoil

Popular Science Monthly May 1938

Silent Cannon Hurls Shells by Electricity

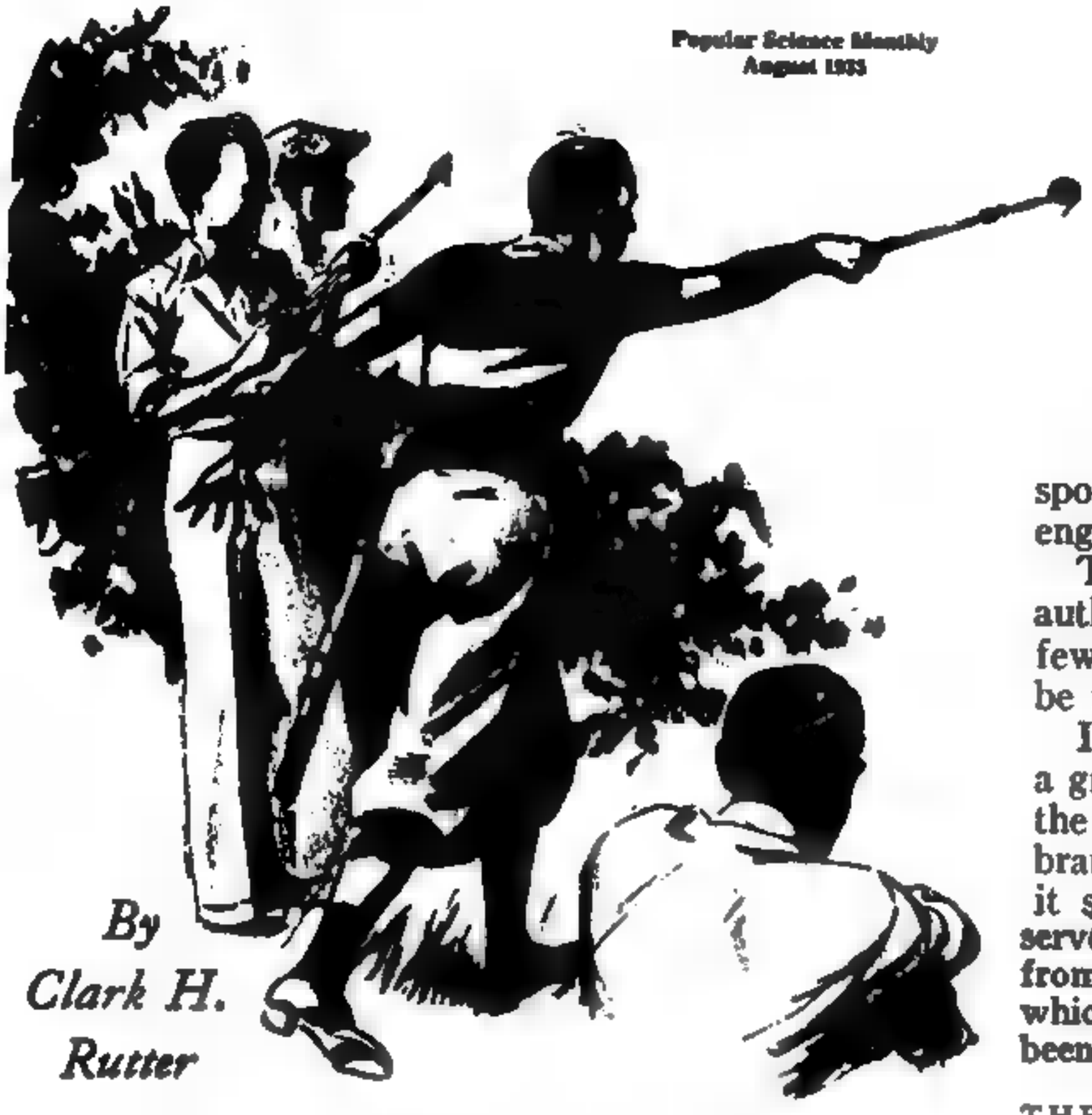


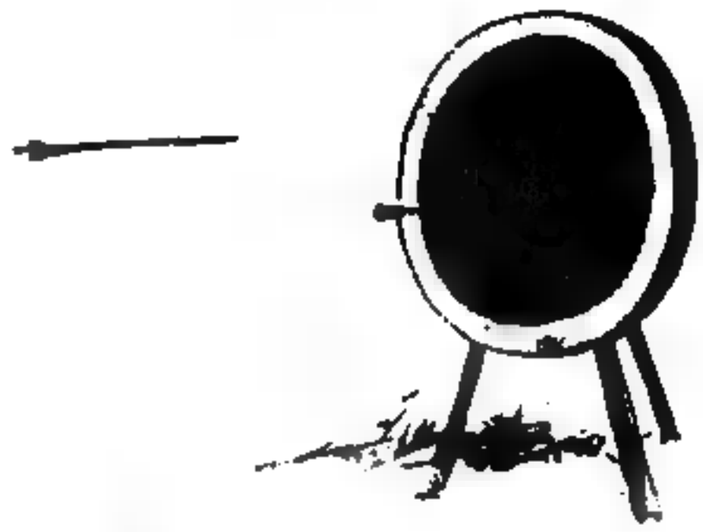
Section of model of electric cannon with the casings and windings removed

WHEN a switch is thrown, a projectile whizzes silently from an electric cannon proposed by a Trenton, N. J., inventor. No sound or smoke betrays the location of the gun, for it dispenses entirely with powder to fire its shells.

Cannon and projectile together constitute a veritable electric motor. When current is applied to the barrel, field coils become energized and the projectile, with a built-in armature, begins to rotate. By shifting the magnetic field lengthwise along the gun, the projectile simultaneously is given an accelerating forward motion. Thus it obtains both the muzzle velocity and the spin required for accurate flight without recourse to a propelling charge or to rifling in the barrel lining. A crude twenty-foot model of his gun, according to the inventor, hurled a homemade projectile—the rotating part of an electric fan—as far as 1,000 feet.

Practical electric guns, the inventor declares, could be built in any standard size and would have a range equaling or surpassing that of conventional artillery. Mobile generating field equipment would accompany the guns and supply the current, as illustrated in the picture at the left.





By Clark H. Rutter

TARGET PRACTICE WITH

Mayan Throwing Sticks

How to make equipment for a novel outdoor sport . . . Arrows are hurled with the aid of a curious ancient weapon instead of being shot

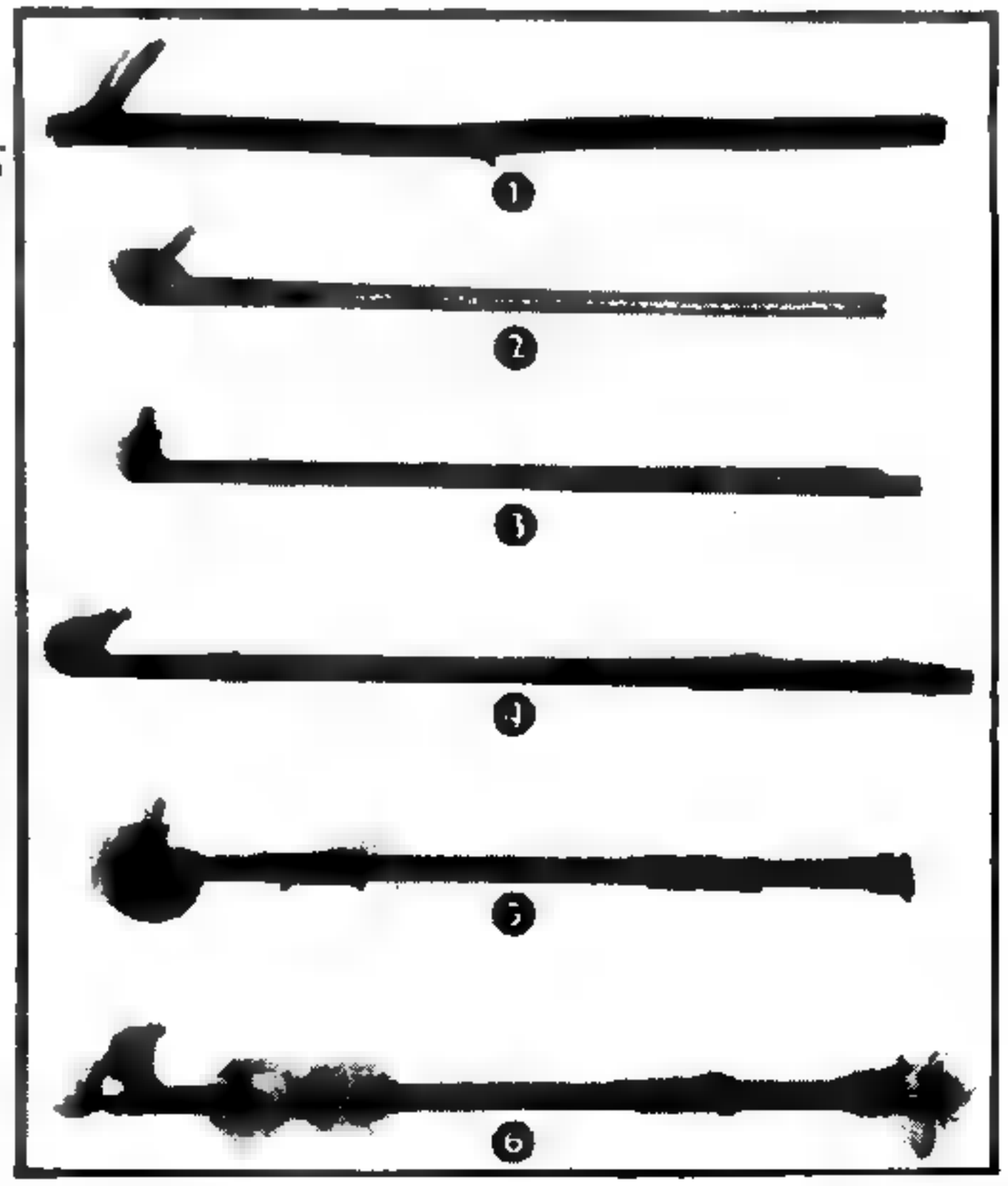
HERE is a fascinating sport that requires little equipment and is quickly mastered—hurling arrows at a target with a homemade hul-che, or Indian throwing stick.

The hul-che was one of the weapons used by the ancient Mayas in Yucatan and other parts of Mexico and Central America. It is merely a stick with a protruding head or peg, which engages the end of an arrow. By means of the stick, the arrow can be thrown great distances with surprising force and accuracy. Unlimited skill may be gained by practice; the exercise is a healthful one; and the sport becomes highly competitive when engaged in by a group.

The sticks illustrated are not copies of authentic Mayan designs, but represent a few of the many types that may easily be fashioned.

In the photograph below, showing a group of six sticks, No. 1 is made from the forked limb of a tree. The smaller branch is burned off to harden and round it so that it serves as a peg. The second stick is whittled from white pine, and the peg is a wood screw, which is rounded with a file after the head has been cut off. Slightly more elaborate is No. 3.

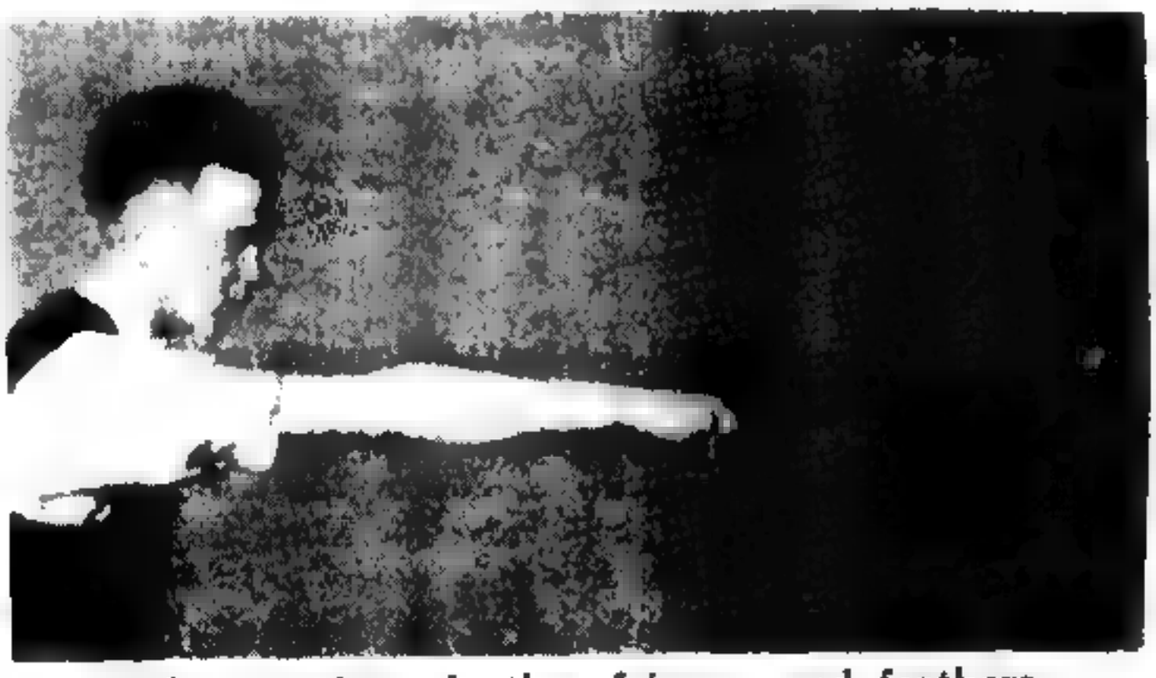
THROWING STICKS Six suggested designs. Lengths may vary from [illegible] to 27 in., and the pegs can be set at any angle from 45 to 80 deg. The first is merely a branch of a tree; the second and third are almost as simple; but the remaining three are carefully made.



It has an ebony peg, and there is a dowel pin through the handle for a finger rest. Cord is wrapped around the stick in two places for decoration.

Still better are the sticks marked Nos. 4, 5, and 6. These are made of maple and have turned ebony, bone, or maple pegs. They are painted in various colors and decorated with

Beginning and end of the throwing stroke



cord wrappings, leather fringes, and feathers, and have leather loops for the fingers. All three sticks can be cut from a piece of maple ⅝ by 3 by 30 in., as shown in a diagram near the end of this article. The stock for the handles is ⅝ in. square. The heads may be cut to any desired design and the handles rounded off and dressed down to about ½ in. round. The sticks are then sanded, stained, and polished.

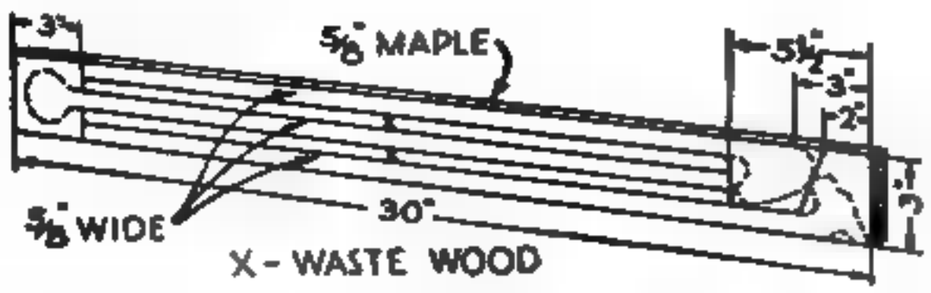
The peg in each case is about ¼ in. in diameter, with a ball formed on the end. A ball will follow the concave socket in the arrow through a greater length of stroke than a plain, straight point. The peg may be set at any angle from 45 to 80 deg.

Glue the peg in a hole drilled in the head. Attach the finger loops and decorations with wrappings of cord such as chalk line. Pull the ends through under the wrappings to avoid knots. The wrappings may be stained with water colors and shellacked when dry.

Although arrows from 28 in. to 5 ft. in length may be used, the standard 28-in. target or hunting arrows obtainable at any sporting-goods store are probably the most practical. It is necessary merely to cut off the nock and form a round concave socket to match the rounded end of the peg. If you wish to make your own arrows, you will find instructions in any standard book on archery.

The method of gripping the stick is illustrated in the accompanying series of four photographs. The second, third, and fourth fingers grasp the handle, while the first finger is folded up out of the way. Place the arrow socket on the peg and lay the shaft along the first joint of the second finger, holding the shaft in place with the thumb. Use only enough pressure to keep it from falling off.

Stand with the feet apart, the left foot forward and pointing toward the target, the right



An economical way to cut three sticks from one small piece of maple or other hardwood

foot back and at right angles to the left, unless, of course, you are a left-handed thrower, in which case the position is reversed.

Draw the stick with the arrow in place straight back over the shoulder and execute a straightforward overhand swing. At the finish of the stroke, rock up on the right toes. Do not try to release the arrow with the thumb, as it is not necessary. If the thumb is pressed lightly against the arrow, but not lapped entirely over the top, the release will take place without conscious effort and at exactly the right time.

The throwing stick ■ by no means a toy. It has a range up to 500 ft., and the power is sufficient to inflict serious injuries. Use the same precautions as with archery. Be especially sure to have plenty of room when you first try out the sport. An archery target is the most convenient to use, but any type of target in which the arrows will stick may be used.

Do not allow children to use the throwing sticks unless under adult supervision. If you regard it as a weapon and use reasonable care, you will find it quite safe and will soon develop considerable accuracy. Continued practice will bring greater skill and increasing enjoyment in this unique and healthful sport.

Scientific American—May 11, 1861

EXPLOSIVE RIFLE BULLETS.

The only superiority which breech-loading cannon has over those which are loaded at the muzzle, is that they are adapted for the use of explosive shells. We do not mean bomb shells, but those which are charged with powder and explode when they strike. Breech-loading rifles may be used for the same purpose in a most effective manner, and we revive our percussion explosive bullet, in order to draw attention to its destructive qualities. Fig. 1 is a section of it, and Fig. 2 represents it after striking and exploding. A is the hollow conical bullet, cast with a stem of lead, ■; or this stem may be a common screw nail placed in the mold to form a pin for the sabot. B ■ a hollow chamber filled with percussion powder, and ■ ■ a plug fitted in the opening. E ■ a sabot made of cork fitted in the stem, D, and two pieces of leather, F, are glued to the sabot, which would be a little wider than the bullet. Such an explosive missile as this may be used for breech-loading rifled cannon, and by having the sabot of greater diameter than the shell, the latter need not be made with lead bands around it.

When used for cannon, the plug, C, should be made of iron: for rifles the plug may be a small conical

Fig. 1

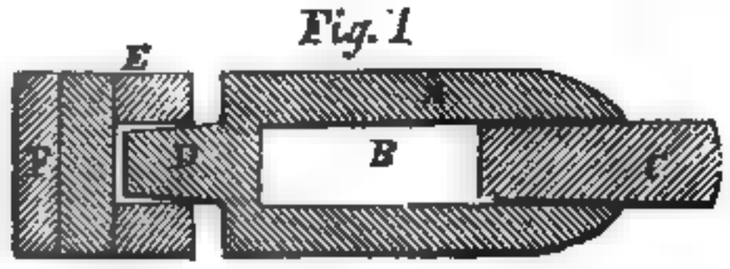


Fig. 2

glass tube filled with percussion powder. When the point of the bullet strikes an object, the plug ignites the percussion powder in the interior, B, and the shell explodes.

We would suggest an important improvement of General Jacobs on this explosive bullet, so as to render it as safe for carriage by a soldier as a common cartridge. It is this:—Instead of casting the bullet for a moveable plug, let it be cast for the insertion of a small conical fixed nipple, to be inserted after the shell is charged with the common powder, or gun cotton. When about to load the rifle with one of these shells, place a percussion on its point, and this, when ■ strikes, will ignite the charge inside.

The late General Jacobs, of the East Indian army, was a most consummate tactician for mounted riflemen. His troops were armed with double barrelled rifles, and were the terror of the natives during the great Indian rebellion. He made a host of experiments with explosive rifle balls; and he has frequently set ammunition wagons on fire at a distance of 1,200 yards with them. With the common rifle, by careful loading at the muzzle, General Jacobs also blew up caissons at 2,400 yards distance, at Enfield, England, in 1857, just with such shells.

In the Baden and Würtemberg German armies, rockets are used for small arms. These rockets are inclosed in copper tubes. Capt. Delvigne has also introduced these explosive bullets into the French army

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Scientific American—Oct. 12, 1861

How a Man feels Under Fire.

The Philadelphia *North American* says:—

How a man feels when in battle is a question that our volunteers have doubtless frequently asked themselves. We yesterday stumbled upon a volunteer on furlough, who first smelt powder at Bull Run. During an hour's chat with him he gave us a very good general idea of the way in which a man feels when

under an enemy's gun. Our friend didn't claim to be especially courageous. He placed due value upon the integrity of the American eagle, but enlisted mainly because he had no other employment at the time. He did camp duty faithfully, and endured the hardships of long marches without any special grumbling. That he dreaded to confront the enemy he freely admits. While willing at any time to kick a bigger man than himself under justifiable provocation, he disliked the idea of the sudden sensation imparted by a bayonet thrust in the abdomen, while only second to this was his horror of being cut down with a rifle ball like an unsuspecting squirrel.

When his regiment was drawn up in line he admits his teeth chattered and his knee pans rattled like a pot-closet in a hurricane. Many of his comrades were similarly affected, and some of them would have lain down had they dared to do so. When the first volley had been interchanged, our friend informs us, every trace of these feelings passed away from him. A reaction took place, and he became almost savage from excitement. Balls whistled all about him, and a cannon shot cut in half a companion at his side. Another was struck by some explosive that spattered his brains over the clothes of our informant, but, so far from intimidating, all these things nerved up his resolution. The hitherto quaking civilian in half an hour became a veteran. His record shows that he bayoneted two of his rebel enemies and discharged eight rounds of his piece with as decisive an aim as though he had selected a turkey for his mark. Could the entire line of an army come at the same time into collision, he says there would be no running except after hopeless defeat.

The men who played the runaway at Bull Run were men who had not participated in the action to any extent, and who became panic stricken where, if once smelling powder in the manner above described, they would have been abundantly victorious. In the roar of musketry and the thundering discharge of artillery there is a music that banishes even innate cowardice. The sight of men struggling together, the clash of sabers, the tramp of cavalry, the gore-stained grass of the battle-field, and the coming charge of the enemy dimly visible through the battle smoke—all these, says our intelligent informant, dispel every particle of fear, and the veriest coward in the ranks perhaps becomes the most tiger-like. At the battle of Bull Run the chaplain of one of the regiments, a man of small stature and delicate frame, personally cut down two six feet grenadiers in single combat. If these things are so—and we incline to think they are—the best cure for cowardice is to crowd a man into a fight and there keep him. The fugitives from Bull Run were men who imbibed panic before it could have reached them.

Scientific American—Oct. 19, 1861

THE HENRY RIFLE.

We take the following account of this famous weapon from *The Ironmonger*:—

At the close of last year we heard that some extraordinary practice had been made with a new rifle, patented by Mr. Alexander Henry, the well known gunmaker of Edinburgh, but as we could not obtain any information respecting the peculiar construction of the weapon, we concluded that its wonderful accuracy at long ranges was mainly owing to good workmanship. We imagined that the skillful gunsmith had turned out a very fine poly-grooved rifle, the novelty of which merely consisted in the number and form of the grooves. We never suspected that he had hit upon an entirely new principle in rifling fire-arms, and had produced a weapon far surpassing the famous Whitworth in precision. Had he been a military man, an engineer, or anything but a professed maker of guns, we should probably have given him credit for some originality.

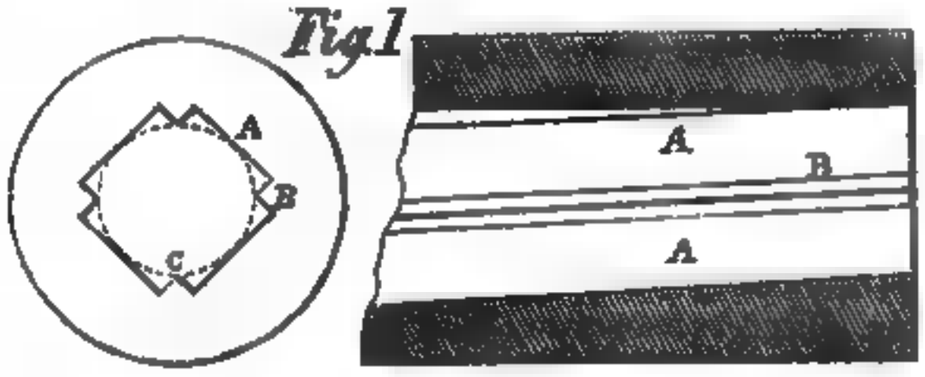
At the meeting of the National Rifle Association on Wimbledon Common, inJuly last, the Henry Rifle was first brought before the notice of our English marksmen, who were amazed at its performances. Sixteen important prizes and most of the pools were won with the new arm. Major Moir used ■ in the contest for the Prince Consort's Prize of £100, which he eventually carried off. Seven shots were fired at each of the ranges, 800, 900 and 1,000 yards, and the winner made twenty-one points. On the last day of the meeting an interesting match came off between Oxford, with the Whitworth, and Cambridge, with the Henry. Each University was represented by two of her best shots. The contest was got up for the purpose of testing both men and rifles. The Cambridge men were undoubtedly the finest marksmen, but their extraordinary score, which, if we remember right, doubled that of their competitors, is partly to be accounted for by the superiority of the Henry Rifle. Mr. Peterkin, with thirty shots, ten at each range, 800, 900, and 1,000 yards, obtained thirty-one points, the highest score ever made on Wimbledon Common at these great distances. Some wonderful shooting was made at the pool targets with the new weapon. Serjeant Dillon got eleven consecutive two-inch bull's eyes at 100 yards. Lord Elcho with seven shots at 200 yards, made six consecutive four and a half-inch bull's eyes and one center.

At the recent meeting of Scottish marksmen at Montrose, the Henry has again made itself heard. With it Mr. Edward Ross won Scotland's Cup, and the first long-range prize or Stranger's Cup. Major Moir succeeded in carrying off the third prize with the very weapon which had proved such a trusty friend at Wimbledon.

In one of the early trials of the rifle Mr. Henry himself fired six shots with it at the extraordinary range of 1,100 yards, and hit the target with every ball, except the first, making three centers and two outers. At the mile range he afterward hit the target, which was six feet high by ten wide, three times out of seven shots. Several military men witnessed this wonderful shooting. In a quiet trial of skill between the famous marksman, Mr. Edward Ross, and his father, "the old deer-stalker," near Aberdeen, the precision of the new

weapon at long distances was strikingly shown. The ranges were 800, 900, and 1,000 yards, and each competitor fired ten shots from a Henry at each range. The father made with his thirty shots, thirty-four points; the son no fewer than forty-three points, only missing the target once. Capt. Moir, on the 23d of April, fired twenty-one shots with this arm at 1,000 yards, and got seven centers, twelve outers, and two misses, counting twenty-six points. These examples of practice made with the Henry will suffice to account for the popularity of the arm. Though its history only begins in 1860, it is now the favourite weapon of many of our most skillful marksmen, and it is generally selected for the first prize by County Rifle Associations. We will now endeavour to describe the most striking features of Mr. Henry's invention. In his specification he claims a system or mode of rifling or grooving firearms, in which a series of planes or flat surfaces are combined with angular, curved or rectangular ridges or "lands." In the explanatory sheet of drawings several modifications of this improved mode of rifling are shown. From four to ten planes and ridges are used in the various forms of the new rifle. The simplest modification is shown in Fig. 1. This barrel is rifled so that its end view or transverse section forms a quadrilateral figure, with angular projections, or "lands," extending inward from the angles of the planes. The periphery of the projectile, *c*, indicated by a dotted circle, touches the center of each plane, *a*. In addition to the bearing surfaces thus obtained there are the angular ridges, *b*, which project inward, so that the apex of each is exactly concentric with the centers of its contiguous planes. These four ridges thus afford a further bearing or support to the projectile. These angular ridges also fill up to a great extent the spaces between the angles of the planes, A, and the periphery of the projectile, thus reducing the windage

Fig. 1

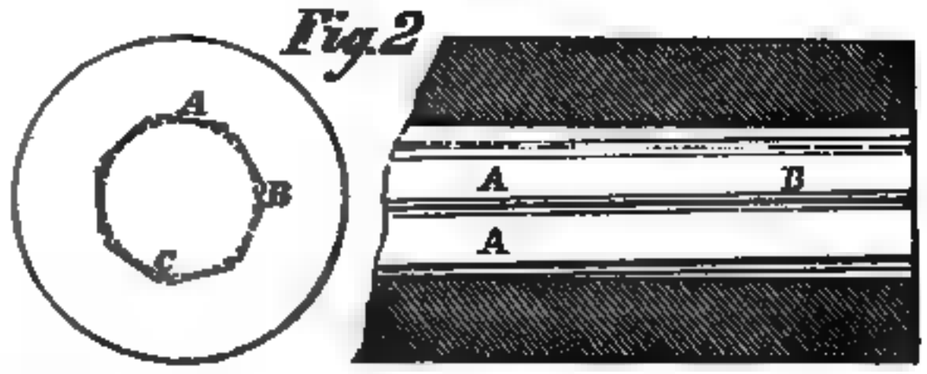


by lessening the amount of expansion necessary to cause the projectile to fit the grooves of the rifle or other fire-arm, so that the rotary or spiral motion of the projectile is obtained with greater certainty, and consequently its flight is rendered more accurate.

Mr. Henry rarely makes rifles with this quadrilateral bore, but the figure shows this principle so clearly that we have reproduced it here.

In Fig. 2 the favorite modification is shown:—There are seven planes, A, and a corresponding number of intervening ridges, B, which together afford fourteen points of bearing to the projectile, C, which very nearly fills up the whole of the bore. This is the form of the ordinary Henry. Rectangular or rounded ridges are occasionally substituted for the angular ones shown in the diagrams.

Fig. 2



In another modification of the new system of rifling, curvilinear grooves are combined with a series of planes. The planes form a polygon, but in the center of each plane a curved groove is formed, and the ridges or boundary lines of the grooves form the bearing points for the projectile.

A larger charge of powder may be used with firearms rifled on Mr. Henry's principle than with others, as there is less liability of stripping the bullet. The increased charge gives a lower trajectory, and ensures greater accuracy in the flight of the missile.

The bore of the Henry is somewhat larger than that of the Whitworth, and the ball is about the same length. The ball fits easily into the barrel, and there is very little recoil. The advantage of the bore seems to lie in the extent of surface which is made to present a resistance to the shifting of the ball in the slightest degree from the grooves, which give it its rotary motion and direction, and in the perfect manner in which the expansion of the ball fills the grooves. The resistance of the air to the ball is so slight that at the marker's butt at the mile range, neither the report of the rifle nor the whistle of the ball is heard; and is only by the ball hitting the ground or the target that the marker knows when a shot has been fired.

The arm does not foul so rapidly as other muzzle-loaders; indeed we heard the other day of a Hythe instructor who had been firing with a Henry for two months, and had never thoroughly cleaned it.

Mr. Henry's patent wind-gage sight is a beautful and simple contrivance for regulating the aim according to the strength of the wind. The sight, either back or front, can be moved to the right or left by an ordinary watch key, and when set to the proper degree it may be shaken or handled without fear of altering its position. With the back windsight, if the wind blows from the right the sight must be moved to the right, and with the front windsight, to the left. The degrees are marked by alternate lines of gold and platinum.

The wonderful practice made with Mr. Henry's rifles proves that the principle upon which they are constructed is a good one.

Scientific American—July 27, 1861

SCIENCE IN MODERN WARFARE.

At the Brooklyn navy yard there are a number of old brass cannon which were captured in Mexico, and preserved as trophies. Great care has been taken to give them graceful forms, and they are covered with ornaments.

In the same yard are a number of Dahlgren cannon. These are simple masses of cast-iron, without an ornament upon, and with no attempt at beauty in their forms. But how great is the contrast in the amount of brain-work represented in these two species of ordnance! The Dahlgren guns are of immense size at the breech, tapering sharply down in the neighborhood of the trunions, and terminating in a chase but slightly conical towards the muzzle This disposition of the metal has been determined by a long and costly series of experiments, conducted in the light of an immense amount of knowledge of the properties of metals, with an intelligent consideration of the forces of expanding gases, of the laws of moving bodies, of the results of chemical decomposition and combination, nearly all of which knowledge has been acquired by mankind since the Spanish cannon were cast.

Before Capt. Rodman cast his 450-pounder cannon, illustrated on page 305 of our last volume, he made a series of experiments to determine not only the best kind of iron to be used in the casting, but also the proper form for the mammoth ordnance. The extent and variety of knowledge made available in determining the form of this simple mass of cast-iron, may be judged by the following list of only a small part of the subjects discussed in Capt. Rodman's report:

"Of the various kinds of strains to which a gun is subject at each discharge.

"Tangential strain.

"Longitudinal strain.

"Crushing force.

"Transverse strain.

"Expressions for tendencies to rupture different kinds of resistance.

"Bursting effects of different weights of powder and shot in guns of different caliber.

"Position of shot when maximum pressure is attained.

"Experiments made for the purpose of determining the relative endurance of guns made from the same iron, but melted in furnaces of different construction.

"Deflection of bars under loads equally distributed along their whole lengths.

"Thickness of metal in the breech.

"Effects of compressibility.

"Termination of bore."

After these, and over forty other subjects of a similar character, are discussed in detail, with many pages of algebraic computations, the lines of the gun are finally drawn, and the mixture of cast iron, with its number of meltings, the form of furnace, &c., is prescribed, and the gun is cast.

Even these facts give but a faint idea of the amount of knowledge and study that is embraced in the production of one of our large pieces of ordnance! The books, which it would be the grossest folly not to read before the experiments are commenced, would form no inconsiderable library.

And all this has reference to only one species of cannon, that which is adapted to sea-coast defense. The ordnance department embraces the various varieties of field artillery, with their carriages, locks, powder and projectiles, round and elongated shot, shells, case, grape, canister and shrapnell. The arming of the infantry and cavalry is a not less extensive study. All of the details of arms for all classes of soldiers have been the subject of costly experiments by the leading governments of Europe, and of elaborate discussions by the foremost minds of all civilized nations.

But the arming of soldiers is only a small portion of the art of war. The equipment, the subsistence, the organization, the transportation of armies, each a science in itself.

All history proves that the success of military operations depends almost wholly upon the intelligence with which they are conducted. The American people, aware of this, have, with prudent forecast, made ample provision for the education in the military art of a sufficient number of our citizens to lead our armies in case of war.

The politicians who had the control of our affairs at the time of the Mexican war, set aside these men who had made the art of war the study of their lives, and entrusted the commmand of our brigades to men who had spent their lives in learning something else—lawyers and politicians like themselvvs. In this war, we rejoice to see that the popular intelligence, always in advance of that of the politicians, is indeavoring to enforce a different policy. Our educated volunteers insist on being led by skilled officers, who, if they do sacrifice the lives of their soldiers, will not do it uselessly in securing defeat.

RATIONS FOR TROOPS

Scientific American — April 7, 1860

At the Division Armory in this city, General Yates has ordered the troops to be supplied as follows: —

For breakfast, at seven A.M., there will be furnished for each man provisions in the following quantities; — One quart of good coffee, eight ounces of bread, and three-eighths of a pound of beef.

At twelve M., for dinner: — Five-eighths of a pound of beef or mutton, well cooked, with potatoes; one quart of baked beans to every ten men; and every other day, in lieu of baked beans, rice, bean or vegetable soup will be furnished at the rate of one pint per man.

At five P.M., for supper: — Eight ounces of bread, three pints of coffee, one quarter pound of cold beef or mutton. The coffee to be furnished will be properly sweetened, and milk in due proportion will also be provided.

Scientific American—July 6, 1861

OLD CHINESE WROUGHT-IRON BREECH-LOADING CANNON.

At the establishment of Messrs. McKee & Judson, iron dealers, 457 and 459 Water street, in this city, there is a large quantity of old iron which came from China as ballast in the clipper ship *Flying Scud*, and among it are a large number of old Chinese wrought-iron cannon, several of which are breech-loading. The *Flying Scud* was employed by the British government as a transport during the Chinese war, and was

furnished with this quantity of old iron as ballast, and when she came home an arrangement was made for ■ to remain in her hold, hence its appearance in our port.

All of these wrought-iron cannon are curiosities, but the greatest interest attaches to those which load at the breech. In the first place, they are of great age. Experienced persons on seeing them pronounce them without hesitation one hundred years old, judging from the rust upon their surfaces. Distrusting the accuracy of this criterion, ■ is still impossible to look at them without being convinced that many years have passed sinced they were forged. They are of very peculiar fashion, and we give an illustration of one of them from an accurate drawing made for the purpose by our artist.

They are all of nearly the same size, and the dimensions of the one represented are as follows :— Length, 5 feet ; diameter at breech, 7 inches ; diameter at muzzle, 5 inches ; diameter of bore, 2½ inches.

The bore at the breech is widened by successive cylindrical enlargements, as represented in the dotted lines, and in the rear of this the external shell of the cannon is continued for a length of fourteen inches in the form of a hollow trough open on the upper side. Through each of the sides of this trough ■ a slot, doubtless intended for a key to hold the breech piece in place. The breech pieces are missing, and whether they were chambered in front to receive the charge, or whether the latter was placed in the bore of the gun, it is impossible to determine.

It ■ well known that breech-loading cannon were tried in Europe soon after the introduction of the use of gunpowder. Still, this proof of their having been employed by the Chinese so long ago will attract attention at this time.

The muzzle-loading wrought-iron cannon that came out ■ the *Flying Scud* are considerably larger than those which load at the breech, and the ability of the Chinese to forge these large masses with their little hammers has excited considerable surprise among our mechanics.

It ■ said to be a universal rule, that in the infancy of the arts great skill ■ displayed in the use of poor tools, and that as civilisation advances better tools are devised, requiring shorter training in those who employ them.

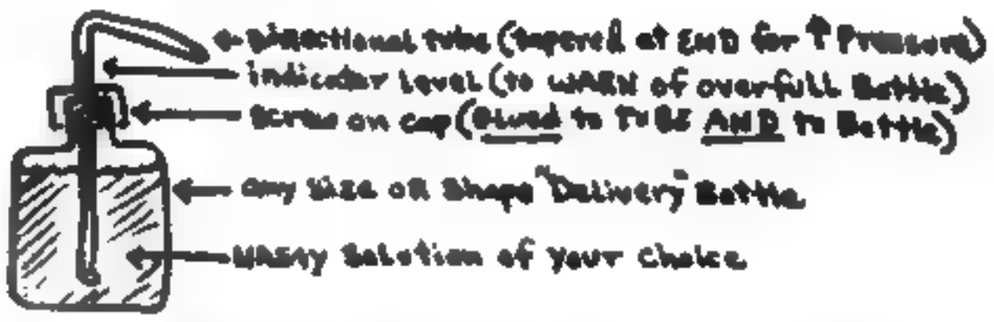
Letter

Dear Kurt:

Concerning the nasal spray article in issue 1; most chemical supply houses carry plastic squirt bottles (your local pharmacist either has them in stock or will order some for you. Ed.) They come in all shapes and sizes. The caps have directional, leakproof screw-on plastic tubes. Directional tubes can be fitted to your favorite nasal spray bottle for increased range and accuracy. A product label soaked off some other medicinal bottle and glued to your new spray will disguise its true nature.

I find that body heat increase the volume of solutions I carry. But directional tubes take up this increased volume and indicate when I'm carrying a bottle that is too full before it leaks. The bottle can be neatly and safely filled in the same sucking up manner you described, through the tube.

I carry twin plastic flasks taped together so that one squeese squirts both bottles. One bottle holds concentrated Ammonium hydroxide and the other holds concentrated, "fuming" Hydrochloric acid. One whiff of either chemical will knock anyone to his knees (try it), and a couple of drops in the mouth, nose or eyes will usually produce unconsciousness within seconds. An average squirt of one second's duration in the face and your attacker will never breath on his own again. Plus, these two chemicals squirted together, produces a dense white smoke identical to burning white phosphorous. So if your attacker is with friends, they will not care ■ share his fate. If they can't get away, you can rob them all at flask-point.



I also add a few drops of red food dye to my solutions so if I do spring a leak I have time to save my skin.

Robert B.

Dear Robert:

The squirt flask and your mixtures are good ideas. However, I don't see much sense in the dye. Say you have your flask in your shirt pocket and it springs a leak. If you were wearing a jacket you wouldn't see the stain. You certainly wouldn't see the stain in another pocket. Besides, by the time you noticed any stain you'd still be doomed, the only difference being that you'd have some of your tissues dyed red as the DMSO spreads ■ through the system. Also, what of your victim? ■ you want passers-by to think he's had some kind of seizure, how will the red stain be explained?

Leaks from modern plastic bottles are little ■ worry about. I've never had any trouble with them. If you are worried, wrap yours in a couple of paper towels and carry it around for a day. If the paper is still dry after a day, I think it's safe for you to carry.

Ed.

Making Lead Shot in 1814

I was fortunate in picking up Vols 2 and 3 of THE EMPORIUM OF ARTS AND SCIENCES, 1812 - 1814. They remind me a lot of THE WEAPONEER, in that succeeding entrants corrected the errors of their fellows. Unlike THE WEAPONEER, there was little mutual agreement at the end of the series so later readers had to prove out the processes. Of course, science was in its relative infancy - those days so no one knew much of anything for sure. It's an education in itself to see how various processes evolved from the putterings in private laboratories and workshops of the 19th century intellectuals and small manufacturies to the impersonal mass production of our times.

The confusion concerning arsenic and its various names, such as orpiment and auropigmentum arose from the degrees of purity and also from regional differences in naming compounds.

The old ways may not be the best, after all. But if you are not equipped to implement the best, often the old ways are the only ways. At least, they are a place for you to start with the best facilities you have on hand.

Shot. Is made by melting lead with arsenic, and pouring it out of Troughs from a great height into a large vessel of water. The height is intended to give rotundity to the shot: the arsenic to make it more fusible, so that it shall preserve its rotundity arising from its liquid state until the moment when it is required to be condensed. Mr. Paul Beck's shot manufactory at Philadelphia, is, I believe, 175 or 180 feet high. The first fall for small shot is about 130 feet, the second fall or melting place, is about 170 feet high.

I give below the common English processes: but in my opinion the practice is, to melt the whole quantity of arsenic, with a small portion of the lead first: and then to add this strongly arseniated lead to the unalloyed lead, when the latter is melted. The arsenic, *should not be orpiment.* It should be white arsenic. It should be mixed with three or four times its bulk of charcoal, lamp-black, rosin, or some carbonaceous or inflammable substance, and being tightly inclosed in several folds of paper, should be thrust down with a stick to the bottom of the lead. The pan of melted lead, should be then covered, in order to aid the impregnation of the lead with the arsenic. The pan should be of thin cast or thick sheet iron; for the heat must not be too great. It is right, when the surface of the lead is irridescent.

As the general method of making shot is kept a secret, I give all the processes I have.

Patent Milled Shot, is thus made; sheets of lead, whose thickness corresponds with the size of the shot required, are cut into small pieces, or cubes, of the form of a die. A great quantity of these little cubes are put into a large hollow iron cylinder, which is mounted horizontally and turned by a winch; when by their friction against one another, and against the sides of the cylinder, they are rendered perfectly round and very smooth. The other patent-shot is cast in moulds, the same way as bullets are.

Common Small Shot, or that used for fowling, should be well sized; for, should it be too great, then it flies thin and scatters too much; or if too small, then it has not weight and strength to penetrate far, and the bird is apt to fly away with it. In order, therefore, to have it suitable to the occasion, it not being always to be had in every place fit for the purpose, we shall set down the true method of making all sorts and sizes under the name of mould-shot, formerly made after the following process:

Take any quantity of lead you think fit, and melt it down in an iron vessel: and as it melts keep it stirring with an iron ladle, skimming off all impurities whatsoever that may arise at top; when it begins to look of a greenish colour, strew on it as much auripigmentum or yellow orpiment, finely powdered, as will lie on a shilling, to every twelve or fourteen pounds of lead; then stirring them together, the orpiment will flame. The ladle should have a notch on one side of the brim, for more easily pouring out the lead; the ladle must remain in the melted lead, that its heat may be the same with that of the lead, to prevent inconveniences which otherwise might happen by its being either too hot or too cold; then, to try your lead, drop a little of it into water, and if the drops prove round, then the lead is of a proper heat; if otherwise, and the shot have tails, then add more orpiment to increase the heat, till it is found sufficient.

Then take a plate of copper, about the size of a trencher, which must be made with a hollowness in the middle, about three inches compass, within which must be bored about 40 holes according to the size of the shot which you intend to cast: the hollow bottom should be thin; but the thicker the brim, the better it will retain the heat. Place this plate on a frame of iron, over a tube or vessel of water, about four inches from the water, and spread burning coals on the plate, to keep the lead melted upon it; then take some lead and pour it gently on the coals on the plate, and it will make its way through the holes into the water, and form itself into shot; do thus till all your lead is run through the holes of the plate, taking care, by keeping your coals alive, that the lead does not cool, and so stop up the holes.

While you are casting in this manner, another person with another ladle may catch some of the shot, placing the ladle four or five inches underneath the plate in the water, by which means you will see if they are defective, and rectify them. Your chief care is to keep the lead in a just degree of heat, that it shall be not so cold as to stop up the holes in your plate, nor so hot as to cause the shot to crack; to remedy the heat, you must refrain working till it is of a proper coolness; and to remedy the coolness

of your lead and plate, you must blow your fire; observing, that the cooler your lead is, the larger will be your shot; as, the hotter it is, the smaller they will be.

After you have done casting, take them out of the water, and dry them over the fire with a gentle heat, stirring them continually that they do not melt; when dry, you are to separate the great shot from the small, by the help of a sieve made for that purpose, according to their several sizes. But those who would have very large shot, make the lead trickle with a stick out of the ladle into the water, without the plate. If it stops on the plate, and yet the plate is not too cool, give but the plate a little knock, and it will run again; care must be had that none of your implements are greasy, oily, or the like; and when the shot, being separated, are found too large or too small for your purpose, or otherwise imperfect, they will serve again at the next operation.

Shot, tin-case, in artillery, is formed by putting a great quantity of small iron shot into a tin cylindrical box called a cannister, that just fits the bore of the gun. Leaden bullets are sometimes used in the same manner; and it must be observed, that whatever number or sizes of the shots are used, they must weigh with their cases nearly as much as the shot of the piece. [*Greg. Encyclo.* 665.

Lead, how formed into shot. Lead is employed in considerable quantities in the casting of shot, for which a patent was granted in 1782, to Mr. William Watts, in consequence of his invention for granulating lead, solid throughout, without those imperfections which other kinds of shot usually present on their surface. The patentee directs 20 cwt. of soft pig-lead to be melted in an iron pot, round the edge of which, a peck of coal-ashes is to be strewed upon the surface of the metal, so as to leave the middle of the latter exposed. Forty pounds of arsenic are next to be added to the uncovered lead, and the pot closely shut; the edges of the lid being carefully luted with mortar, clay, or other cement, in order to prevent the evaporation of the arsenic. A brisk fire is then kindled, so that the two substances may be properly incorporated; when the metal ought to be skimmed and laded into moulds, that it may cool in the form of ingots or bars, which, when cold, are called *slag*, or poisoned metal—20 cwt. of soft pig-lead, (according to the quantity of shot intended to be manufactured) are next to be melted in the manner above directed; and, when it is completely liquefied, one of the ingots or bars of slag must be added: as soon as the whole is combined, a small quantity of the liquid metal is to be taken out with a ladle, and dropped from a height of about two feet into the water. If the shot be not perfectly round, it will be necessary to add more slag, till it drops in a globular form. The metal is next skimmed, and the scum poured into an iron or copper frame perforated with round holes, according to the size of the shot designed; the scum is then to be squeezed while soft, through the frame, into which the liquid should be poured, and dropped through the holes. For the smallest shot, the frame must be at least ten feet above the water, and for the largest, about 150 feet; the height being increased or diminished, in proportion to the size of the shot. [1 *Art. Man.*

Shot Manufactories have lately been established or revived, and appear to promise to supersede the importation of English shot. They are manufactured principally from Lead found in Louisiana, and shipped from New-Orleans.

Patent shot, as Dr. Black has informed us, are manufactured in England as follows:

A little orpiment or arsenic is added to the lead, which disposes it to run into spherical drops much more rapidly than it would do when pure. The melted lead is poured into a cylinder, whose circumference is pierced with holes. The lead streaming through the holes soon divides into drops, which fall into water, where they congeal. They are far from being all spherical, many being shaped like pears, and must be picked. This is done by a very ingenious contrivance. The whole is sifted on the upper end of a long, smooth, inclined plane, and the grains roll down to the lower end. But the pear-like shape of the bad grains makes them roll down irregularly, and they waddle as it were, to a side; while the round ones run straight down. They are received into a sort of funnel, which extends from the one side of the inclined plane to the other, and is divided by several partitions, so that it is really the mouth of several funnels, which lead to different boxes. Those in the middle receive the round grains. [2 *Art. Man.*

The shot when made, is separated into sizes by means of sieves, whose wires are set according to the different sizes required. The shot is glazed by putting them into a barrel and turning it round, till by the friction and attrition they become perfectly round, smooth and shining.

I believe in this country, the proportion of arsenic is nearly as follows. About 7 lb. of arsenic is first added to about five hundred weight of the metal. Then of this mixture, so much is taken to add to the fresh lead, as will make the proportion of arsenic about 1 1-2 or 3 lbs. to the ton. Of this about one half a pound will evaporate. Compare this with the English patent proportions above given.

In the Louisiana country, shot manufactories are established, where the shot is made by letting the lead fall from the top to the bottom of the bank of the Mississippi, at low water: so that the enormous expence of such a building as that in Philadelphia, is saved. T. C.

The Price of Enfield Rifles

Scientific American—Oct. 12, 1861

The price of fire-arms in England has greatly advanced in consequence of the demand from the United States. The Enfield rifles, which cost formerly fourteen dollars, now sell for twenty-one dollars. As the old muskets rifled, which any of our machine shops would soon effect, are said to be equal to the Enfield rifle, we do not see why we should pay such an enormous price abroad for arms which can be so easily supplied at home.

The Deadly Fighting Bolas

By KURT SAXON

A little known and underrated weapon has been the bolas. It consists simply of three balls, or weights, of metal or leather-covered rock, tied to three equal lengths of cord, knotted at the end.

The Argentine gauchos have used the bolas for centuries for the same purposes the American cowboy uses the lariet. A gaucho can whirl a bolas and catch a calf or bull around the fore or hind legs with just as much skill and effect as any cowboy with his rope.

The bolas as a weapon should have lead weights. ■ should have great power to entangle and also to stun or kill.

A skillful user of the bolas can trip up an approaching or escaping enemy by wrapping the weighted cords around his legs. Better still, is to kill him by hurling the flailing scourge so it wraps around his neck and head, choking him and/or breaking his skull.

The bolas is not limited to throwing. When held by the knot at the end ■ the cords and swung around the head, you can make any sub-human rat pack stay well away, if they don't have guns.

I don't care if it's a 300 lb. psycho or a Karate expert; ■ you can lift and swing 10½ ounces, you can defeat any lesser armed opponent.

Throwing the bolas takes some skill. After about 200 throws you'll begin to get the hang of it. You start by holding one weight in your throwing hand and swinging the other two around your head.

Be sure you're in a cleared space with a tree or post as a target. Hay bales or a blanket or something else soft wrapped around your target will keep the lead weights from losing their shape on impact, for the impact is indeed great.

Start a gentle swing, extending your arm above your head. ■ you aren't well enough coordinated ■ keep the whirling weights above your head, you'd better stick to name-calling. Extreme carelessness or using while intoxicated could mean the end of you.

I'm sure you've heard of the Nunchaku, the oriental rice flail consisting of two foot-and-a-half lengths of broomstick connected by about six inches of chain. This is dramatic to watch but illegal to carry and hardly concealable.

The best Nunchaku man would not stand a chance against an indifferent user of the bolas. And the bolas is easily concealed. Of course, if you just carry them in your pocket, they'll be all tangled and this won't do at all ■ you're attacked. So I naturally invented a carrier for the bolas to make them instantly accessable, without tangling.

I bought a length of plastic plumbing tubing from the hardware store. ■ is 1 5/16th of an inch across. Tubing slightly smaller would do as the weights are one inch across. Even so, you don't want too snug a fit, so that size is fine, whereas a larger tube could allow tangling.

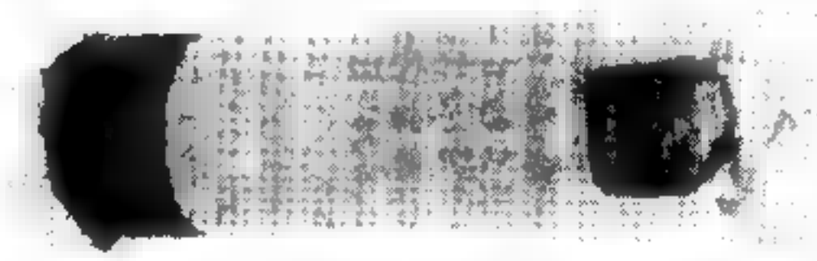
Anyway, I cut the tube four inches long. Then I cut out a circle of cardboard for the bottom. After fitting the cardboard inside the bottom of the tube I put lengths of electrical tape across it, then put a strip around the bottom to make it look uniform.

Then I sawed two 3/4 by 3/4 inch slots in the top and broke them off. This enables one to grasp the sunken weight with the thumb and forefinger and pull the bolas out with one smooth, easy motion.

To hold the tube, you should sew a pocket to the inside of the front of your pants about three inches to the left of the zipper and about one inch below the waistband. (Left-handers put the pocket three inches to the right of the zipper).

To make the pocket, simply cut a 4½ by 4½ inch square of heavy cloth. Sew it with the same color thread as your pants. It's such a small job you don't even need a sewing machine.

The pocket should be snug. But if yours is so loose the tube might come out when you yank the bolas, either sew another stitch in closer or use a large safety pin. Push the pin through the waistband and around the thinnest



lip of the tube. That way, there is plenty enough room to withdraw the bolas, the tube will not creep up in the pocket and the safety pin will be hidden by your belt.

Say you want it ready to use as throwing bolas. Put one weight in the tube and push its cord down on top of it. Do the same with the second weight. Keep out the last weight and push its cord into the tube and then put it in and push it down just so it is even with the top of the tube.

If you don't expect to be actually throwing the bolas, pack the weights so the knot projects to where a weight would normally be. A quick and effortless tug on the knot will have the clonkers ready to swing in a second.

With the tube in the pocket, just so, there is no noticeable weight nor any pressure on the abdomen; unless you wear your pants very tight in the waist.

Don't let the simplicity of this weapon or its origins make you despise it. ■ is lethal, concealable and instantly accessable. With it, you need fear no one lesser armed.

Saxon's Ultimate Fang

By Kurt Saxon

How often have you longed for a weapon which ■ lethal, silent, concealable, quick, cheap and untraceable? I couldn't find one so I invented the Ultimate Fang. Egomania demanded I give it my name.

It ■ a new concept in weaponry, similar to the tranquilizer darts shot from guns. But since those and the guns to shoot them from are unavailable ■ the public, my Fang will have to do.

It is a hypodermic syringe with needle which, upon penetration, automatically injects 2 ccs of poison into your opponent's system.

Examine Figure 6. When the barb and needle enter the flesh, the bent end of the paper clip and the cutter is pushed back, cutting the fish line holding the rubber band. Upon release, the rubber band pushes the plunger, which empties the hypo.

The Fang ■ first loaded with the poison of your choice and carried in the holder diagrammed in Figure 8. If you need personnal contact with an opponent, you simply remove the holder's cover, approach him from behind and jab the protruding point into his rump.

The fish hook barb will hold it in and the poison will be automatically injected into his system before his reaction time will let him yank it out. By that time, ■ ccs of death will have poured in and only the Great Pumpkin couldn't keep him alive for more than a few seconds.

If you anticipate a mugging or other attack, have the cover off and the Fang upright. Best ■ jab it into a fleshy part of his arm, upper thigh, throat, cheek or belly. The suprise of your attack, the penetration and his own reaction time will doom him before he can stop its lethal flow.

If you prefer to hit him from a distance, you'll want a blowgun. The Fang will go with great force and accuracy for a distance of from 20 to thirty feet, depending on your lung power. This ■ plenty if you are lurking around a corner or sitting in a car at the curb. Anyone walking by or entering or leaving a building ■ within easy range.

If you must practice on live prey, sit in your car on a Saturday night when the wierdos prowl your downtown area. Best to sit on the passenger's side in front and shoot through the rear window. When you see a likely degenerate; fag, pimp, punk or Liberal, aim at the face, belly, thigh or rump and let fly. Then, dissasemble the blowgun, drop it behind the back seat, scoot behind the wheel and drive off. The Fang you leave behind is untraceable. Hundreds ■ millions of throwaway hypos are sold each year all over the country by the same company. Also, there is too little surface area which could hold a recognizable print. Just in case, you might wipe the tube and the tape with a cotton swab just before putting the Fang in its holder.

Don't worry about being observed by passersby. The more people there are, the better your chance ■ going unnoticed. Urbanites seldom see anything they aren't on the make for so you can act with impunity. Most likely, their only reaction to the victim's death throes would be to steal his watch or cop a feel.

Now to the making of the Fang. It is simple to put together, requiring no skill or special equipment. Nearly everything used in its construction, except the hypo, can be gotten from your local supermarket, hardware or dime stores.

The hypos are B-D (Beck-Dickenson) 3 cc 21 G 1 syringes, bought at about $25.00 per 100 from any pharmacy. Here in the Free South, anyone can buy them individually or by the box on request.

Figure 1 shows the hypo as ■ comes from the manufacturer. Pull out the plunger and clip off two edges with scissors as shown in Figure 2. This allows the rubber band to rest firmly.

Next, clip off the rubber ring (middle illus. Fig. 2) nearest the plastic. This ■ not necessary if you intend to deliver it by hand. But the double ring presents a problem when the Fang ■ shot from a blowgun. Having two rings makes it tend to bind to the sides of the tube, needing a little extra pressure, which can't be applied once it's left the blowgun.

With a razor knife, cut through the tube to remove the finger holds (Fig. 1).

Next, drill or burn a hole through which to tie the release mechanism in place. (Examine the far right diagram in Figure 2). Put the plunger in so the first ring rests on the 2 cc mark, as in Figure 4, and ■ turned so the clipped end is on its side. Then, unbend a paper clip and hold one end of it in the fire to make it red hot.

Burn the hole through the tube and directly behind the plastic circle at the business end of the plunger. If you burn it, you'll have to remove the plunger and cut off any melted plastic that might stand out and catch on the tube. It's better ■ use a 1/16th inch drill.

The needle has to be cut ■ half and reground. This is to keep it from bending on impact and the regrinding is to prevent the tip from clogging as ■ enters.

For regrinding, I use a fine wheel and put the needle to its rim edge to cut, then angle it on the flat part of the rim so the reground tip is the same shape as the original. The wheel tends to burn ■ so any ash must be scraped from the tip. However you do it, use a darning needle to scrape out any ash, burrs or filings that might clog the tip.

■ you have no grinder, just cut the needle with a scissors and regrind the tip with an emery cloth or stone. Just make sure the tip ■ clear and test it by filling. If the liquid doesn't squirt out straight, it's clogged. So keep scraping and reaming until you get it right. It just takes a minute.

As shown at the right of Figure 3, shove the hypo needle through the middle of the end of a No. 62 to 63 rubber band you can buy from any of-

PARTS FOR SAXON'S FANG

FIG. 1

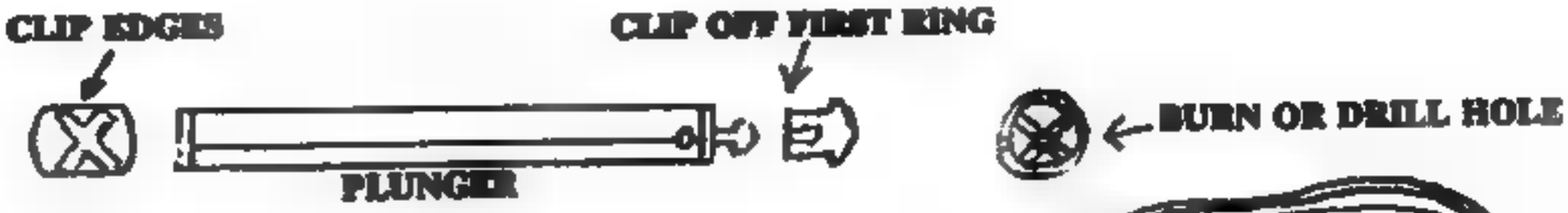


FIG. 2

FIG. 3

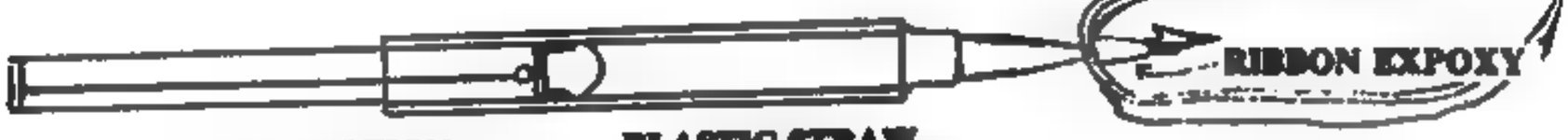


FIG. 4

FIG. 5

FIG. 6

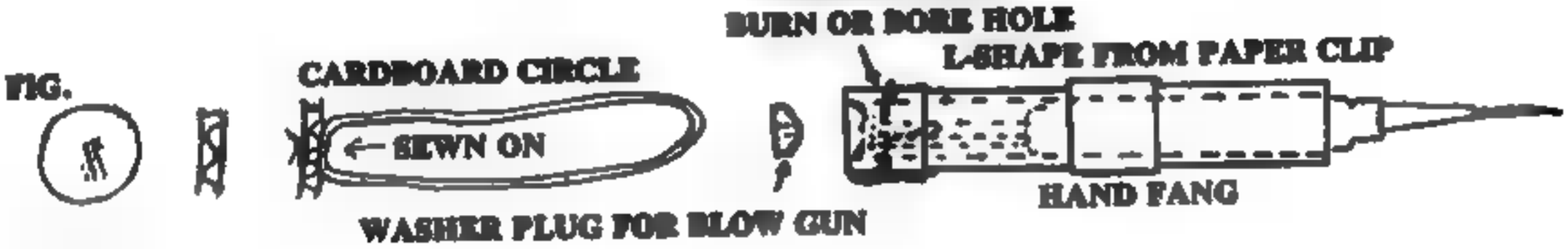


FIG. 7

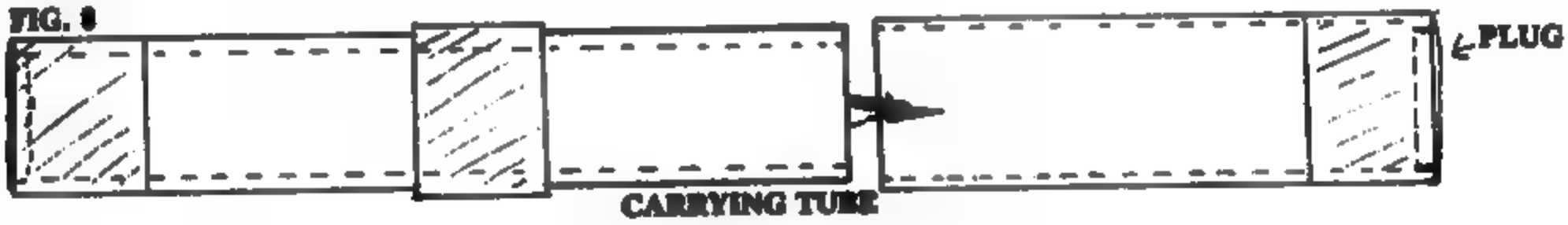


FIG. 8

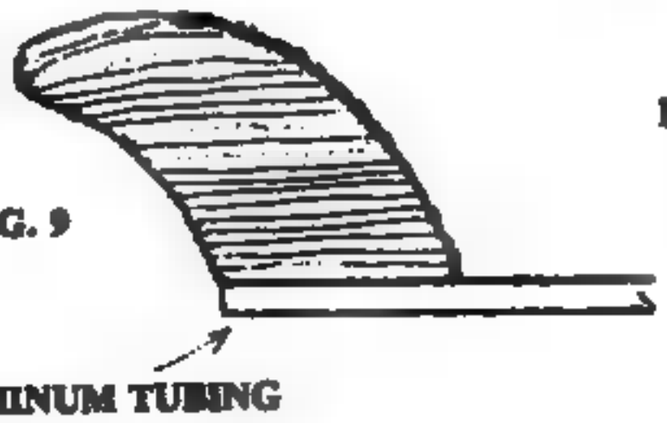


FIG. 9

FIG. 10 SECTIONED BLOW GUN

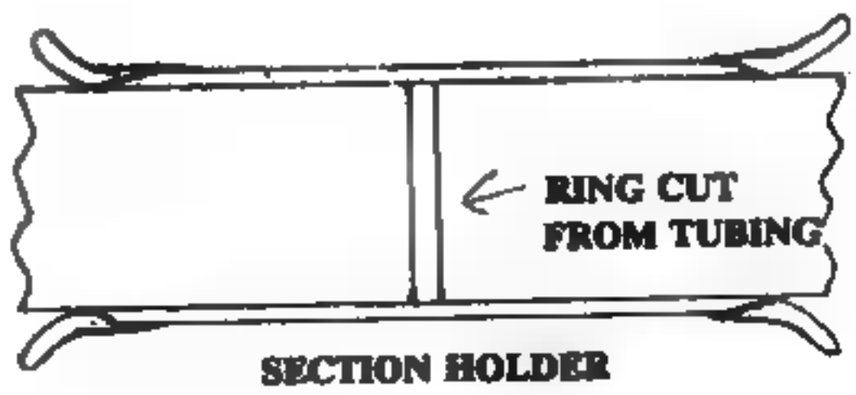


FIG. 11

fice supply store, ■ you don't have some around. Flattened, they measure ■ 3/4 inches long by 3/16th inch wide. Use a brand new one for fastest flow.

For the barb, you'll need a fish hook. Bronze colored hooks are tempered too hard and so are almost impossible to bend without breaking. Thus, the shaft behind the barb will be too long and also curved, or it will be too short to handle. The silvery ones can be straightened and so can be cut so the shaft rests on the hypo's needle end and the barb projects slightly beyond its tip as shown at the right ■ Figure 3.

From my Wal-Mart store I got a package of 50 FAST GRIP LIMERICK HOOKS, No. 2/0s. If you have no vise, hold the tying eye in a regular pliers and do the bending with needle nosed pliers.

To attach the barb to the needle, use ribbon epoxy. Liquid epoxy or plastic glue is messy and unreliable. Ribbon epoxy comes in a 14 inch, yellow and green strip. Cut off about 1/8 inch and knead it between your thumb and forefinger until ■ is thoroughly mixed. Wrap it around the barb and needle, as in Figure 4, and dispose of the excess. (DURO E*POX*E RIBBON is sold in most hardware stores for about $3.00. It sets in 2 hours and completely cures in 12).

For the mechanism (Fig. 5) which releases the rubber band, use a regular sized paper clip. Leave the larger bend alone and straighten the rest with the needle nosed pliers.

To hold the paper clip to the tube, allowing it to move freely, use a one inch length of plastic tubing which is thin enough to keep the paper clip from slanting. I use the plastic tubing cut from Q-Tips. these have cotton swabs at each end and are gotten at any supermarket in the beauty aids or baby section.

After putting the straight end of the paper clip through the tubing, use the needle nose pliers to bend the paper clip's end as in Figure 5.

For the cutter, a shred broken from a razor blade will do. But for uniformity and convenience I use the snap-off cutter blades which come with the razor knife (NT CUTTER A300), carried by, or ordered through most office supply stores. Another brand with snap-off blades is sold in most supermarkets. (These razor knifes are much better than X-acto Knives. As the tip dulls, another ■ there to take its place and since it is retractable by the thumb, it also mades a dandy anti-mugger weapon and it's legal to carry).

To attach the cutter (Fig. 5) prepare the same amount of ribbon epoxy as used to attach the barb to the needle. But instead of wrapping it around, simply lay the snap-off blade section down and put the large bend of the paper clip over it. Then press the epoxy on the blade and mold it so it connects with the paper clip as shown.

Next, position the cutter and tube on the hypo as shown in Figure 5. Then, put a strip of 3/4 inch wide plastic electrician's tape on the cutter tube and press firmly so the tape covers as much of the cutter tube as possible, then smooth it around the hypo tube.

After loading the hypo with poison, you'll want a large eye darning needle and about a foot of 12 pound plastic fishing line. Put about an inch of line through the eye and stick the needle through the cutter head, hypo tube, plunger, and out the other side as shown in Figure 6.

Tie tightly, hold it down at the join and tie a knot. Now all you have to do ■ carefully hold the hypo at the tube's end just beyond the cutter and pull the rubber band over the plunger so it rests across the clipped edges.

You can keep ■ so loaded for days before use but the longer you wait, the less tensile strength the rubber band will have. After two or three days, this would only mean that the plunger would take maybe half a second longer to empty the hypo. Even so, there's little reason to place the rubber band more than a couple of hours before use.

If a delay of several hours or days is necessary, dab a little vaseline on the needle tip ■ keep the poison from drying and clogging it.

Now for the carrier. (Fig. ■ It consists first of a 4 3/4 inch long tube to hold the Fang and another 3 1/8 inches long for the cover. However you want to measure the carrier tube, make sure the barb projects a bit over a half inch. If delivered by hand you'll feel a sense of assurance ■ know that the fish line will be cut and the back of the tube will start the plunger on its way just in case you neglected to cut off the last ring on the plunger's tip.

My holder ■ of CPVC plastic tubing, 7/8 OD (outside diameter). This can be bought from most hardware or plumbing supply stores for about $4.00 for ten feet. CPVC comes only in 5/8 and 7/8 OD and the 5/8 ■ too small. The aluminim tubing for the blowgun ■ 6/8 OD and therefore more compact. But the slight difference isn't important and you can't get the aluminum holder past a metal detector.

Whichever you use, make a circular cardboard plug to fit inside the tube, press a short length of the plastic tape on it, fit it inside the tube, as shown, and lap both ends of the tape over the outside. Then wrap one thickness of tape around the plug tape.

Next, wind more tape, starting 2 5/16ths inches from the bottom and

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Scientific American—July 25, 1861

Vent Stopper For Cannon

The most common cause of accidents with a cannon is the imperfect closing of the vent in loading. When a cannon is fired, pieces of the cartridge bag are frequently left in it on fire, but the smoke soon extinguishes them; if any atmospheric air, however, gets access to them they continue to burn, and when the cartridge is run down it is kindled, causing a premature discharge, which generally blows off the gunner's arm, and is very apt to kill him. To prevent this, a man is stationed at the vent to keep it tightly closed during the process of loading, but it seems to be almost impossible to teach men to perform this service thoroughly; hence the great number of accidents.

To secure a perfect closing of the vent in all cases is the object of the invention here illustrated. An elastic leather pad, A, is secured to the lower side of the lever, B, which is hinged to the breech of the gun in such position that, when it is turned down, the pad is brought directly over the vent. A hook or catch, C, is fixed to the gun on the side opposite the hinge, in a way to catch by a spring over the lever as the latter is turned down, and hold it securely in place with the pad pressed down upon the vent.

It would seem to be impossible for the most unskilled soldier to avoid closing the vent perfectly with this simple arrangement.

The patent for this invention was procured, through the Scientific American Patent Agency, May 28, 1861, and further information in relation to it may be had by addressing the inventor, J.J. Hirschbuhl, at Louisville, Ky.

to a thickness of about 1/16 inch. This is to keep the cover from touching the barb.

For the cover, use two strips of regular typing paper 2-1/8 inches wide. Wrap one strip snugly around a piece of the holder tubing and spread glue along its width. Then finish wrapping the first strip, glue it down and do the same with the second strip. This will give the cover its proper thickness. Slip it off the tubing and make a plug in the same way as for the holding tube. That's all there is to that.

The only difference in the Fang when you mean to use it in a blowgun is the propelling shield, without which you'd just blow it out onto the sidewalk. For this, cut a 5/8 inch circle of corrugated cardboard. (Fig. 7). You can also get 5/8 inch plastic buttons from the local sewing shop which will serve as well.

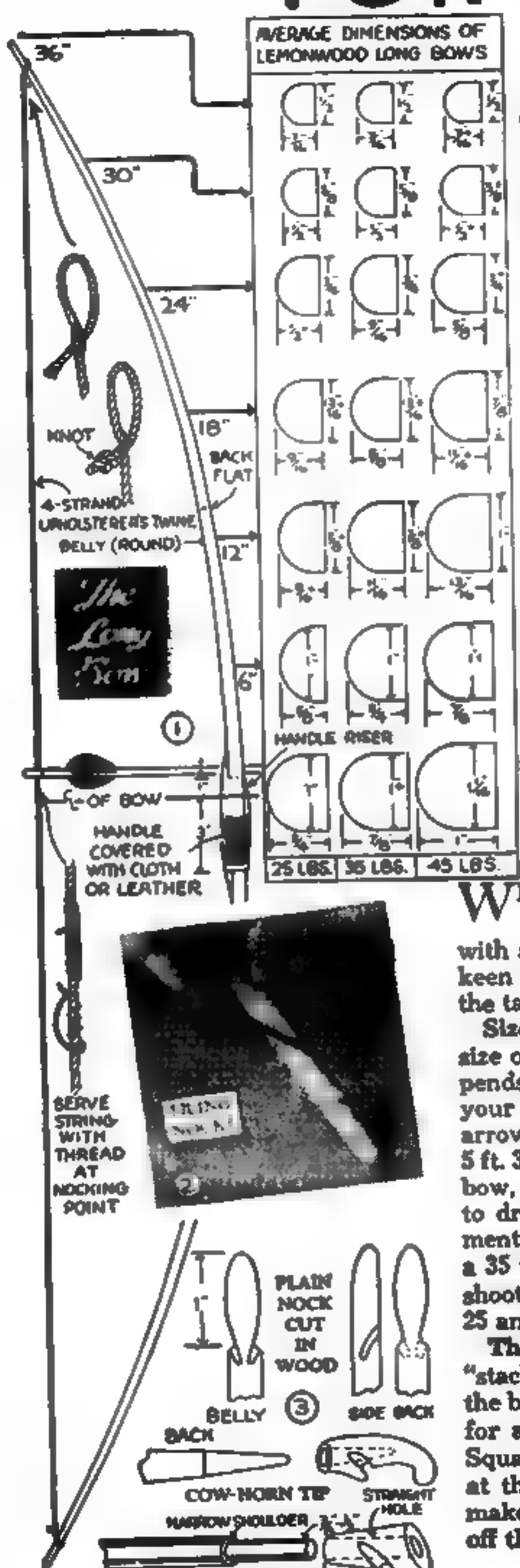
With your darning needle and thread, sew the cardboard or button to the other end of the rubber band with three or four stitches. When pulling the rubber band back over the plunger, don't pull it by the cardboard or button. Instead, use a knife or similar flat instrument under the rubber band and ease it over the plunger.

For the blowgun, (Fig. 10) you will need about five feet of 6/8 OD aluminum tubing. I got mine from the manufacturer here in Harrison so I don't know how common that size is in other areas. By calling around, however, you should find a source.

Commercial blowguns have mouthpieces but I can't tell the difference between using one with and one without a mouthpiece. But ■ you must have a mouthpiece you can easily make one (Fig. 9) with plastic-backed rubber tape from your hardware store. This tape sticks only to itself and I think it's used for sealing plumbing joints.

To make the mouthpiece, wrap the sticky side of the rubber tape, after removing the plastic, around one end of the tube. As you wrap, gradually layer it further from the end of the tube, as shown. When you have it wide enough and deep enough to ■ your lips in comfort, cut the tape and smooth it down and you'll have as good mouthpiece as any you can buy.

SHOOT A BOW FOR FUN



Popular Mechanic 1940

WHETHER you try to land six in the gold for a perfect fifty-four or take your archery with a dash of small game hunting, you will find keen enjoyment in this ancient sport. Making the tackle is simple.

Size of tackle: The first thing to know is what size of bow and length of arrow to use. This depends entirely on your physique, and particularly your reach. If your reach is 64 in., you can use an arrow 25 to ■ in. long, with a bow not less than 5 ft. 3 in. from tip to tip, Fig. 5. The weight of the bow, that is, the number of pounds pull required to draw it, depends on your muscular development. Most men can draw a 50 to 60-lb. bow, but a 35 to 40-lb. bow is the best weight for general shooting, and good scores can be made with the 25 and 30-pounders.

The long bow: The long bow has a deep or "stacked" body, which is generally recognized as the best type of bow shape. A stave of lemonwood for a long bow will cost you about one dollar. Square up the stave to a little over the dimensions at the handle of the weight bow you intend to make. Bandsaw the wood, Fig. 4, and then round off the belly side with a plane or wood rasp. Cut

You may want to carry your blowgun around with you in a briefcase, or shopping bag, depending on your station in life. If so, you'll want a take-down model which comes apart in sections.

The standard blowgun is around 54 inches long. So cut your tubing into three 18 inch lengths. (Fig. 10) With an electric grinder or a file, take off the edges of the ends so they slope. This makes ■ easier to fit the sections into their holders.

As in Figure 11, cut two 1/8 inch rings from the scrap tubing to fit in the middle ■ the holders. This allows you to automatically push each section an equal distance to the middle. With a round file or sharp knife, ream out any rough edges or burrs from the inside edges of the tubes and rings.

■ your only purpose for having a blowgun ■ recreational, a simple, layered paper tube ■ enough. It is also enough if you expect pretty good light to assemble it by.

In this case you'll need six or more 4 inches wide by 11 inches long strips of typing paper or that from a paper sack. Lay a section of tubing on a strip and roll the tubing and paper away from you. Put a line of ELMER'S GLUE-ALL, or similar brand of fast drying white glue across the edge of the paper facing you. Make it as snug and as straight as you can. When the glued edge contacts the paper further on, begin correcting for straightness and snugness. As the roll nears the end of the strip, put on some more glue and proceed until you have it about 1/8 inch thick, or more. The proper thickness will insure the blowgun's straightness and hense, ■ accuracy.

When two such rolls are made, ease the rings in and push them further with the lengths of tubing. You might mark the tubing 1 15/16 inch from the end so you'll know that when both tubes are in place, the ring is exactly in the middle. Then remove the tubing, turn the paper roll up and toward you and glue the ring using one of the Q-Tips swabs. With the outer edges of the tubes ground down, ■ ■ easy ■ fit them into the rolls in good light.

If you expect to be working in very dim light, you'll need flared ends for the section holders so you can assemble the blowgun by feel. Since

the nocks 1 in. from each end, Fig. 3, using a round file, Fig. 2. Make a bowstring from upholsterer's twine, as shown in Fig. 1, and brace the bow as in Fig. 6. When the bow ■ braced the height of the string from the center of the bow should be about equal to the width of the hand and thumb with the latter stuck out as in Fig. 28. You can now "tiller" it to check the bend of both limbs, at the same time measuring the weight with a spring scale, as shown in Fig. 10. Bend the bow gradually. Take off a shaving here and there to equalize the bend. Take your time. You can always take off more wood, but you can't put it back on again. The bow should be quite stiff for a distance of about 6 in. at the center, and should then curve evenly to the tips. The beginner's most common fault is to make the bow "whip ended," Fig. 9. Besides checking the curvature, sight down the bow as you work and note if the string cuts the center of the belly, as in Fig. 7. If it throws off to the side, your bow has a turn in it. This can be corrected by taking off wood opposite the turn.

■ desired, you can back your bow with red or black fiber attached with waterproof glue before the shaping is started. Instead of cutting plain nocks, you may decide to purchase and fit a set of cow-horn tips, or, you may want to turn them from colorful plastic. It will be noted, Fig. 3, that plain nocks are not cut across the back of the bow as this would weaken the wood. The groove in horn or plastic tips, however, is let into the back.

The flat bow: The flat bow is easier to make than the long one and can be 3 or 4 in. shorter for the same length arrow. The same general method of handsawing is used, Fig. 8, but the belly side is only lightly rounded off. Typical sections of a 40-lb. flat bow are given in Fig. 11. The handle riser can be the same or of a contrasting wood to the bow itself. The narrow plate, which prevents wear, is inlaid, using a 3/16-in. disk of 1/8-in. plastic.

Self arrows: A "self" arrow is one made from a single piece of wood. The simplest way to make self arrows is to buy a construction kit, which includes the 5/16-in. dowel sticks, feathers and heads. Birch is the best wood to use. The various parts and dimensions of the arrow are shown in Fig. 12. First put on the head. A number of different ones can be purchased, but for average target work the brass parallel pile head is most satisfactory. Cut the tenon on the end of the shaft by turning on a lathe, Fig. 14. If you are careful, the head will be a drive fit and will hold securely. If the head is a bit loose, anchor it with a few punch taps as shown in Fig. 16. Cut the arrows to the required length and then cut the nocks. Plain nocks can be cut easily by running the shafts over a circular saw, as in Fig. 13. The nock should be across the grain. If you want more strength ■ the nock, insert a thin slip of fiber or plastic. Aluminum or molded-plastic nocks are

you've already got the ribbon epoxy you might as well use it for the section holders too.

First, using an electric grinder or sandpaper, grind the edges of the section holders back in a slope 1/4 inch from the ends. Knead 5 inches of the ribbon epoxy and roll it into a cylinder. Cut it into four equal pieces. Roll each part to 2 3/8 inches long and press to about 1/2 inch wide and 1/4 inch from the ends. With the first, or index finger inside the holder, use the thumb to press and flare the ribbon epoxy as shown in Figure 11.

After the sections have set 12 hours they are ready ■ use. The flared ends will enable you to put them together by feel.

SAXON'S HAND FANG

The Hand Fang ■ only for the delivery by hand of poisons. Although the Ultimate Fang can be used and delivers 2 cc surely, it is harder to make and is gone, as the police simply will not give it back. Therefore, I would restrict the Ultimate Fang for distance and use the Hand Fang for close-up work.

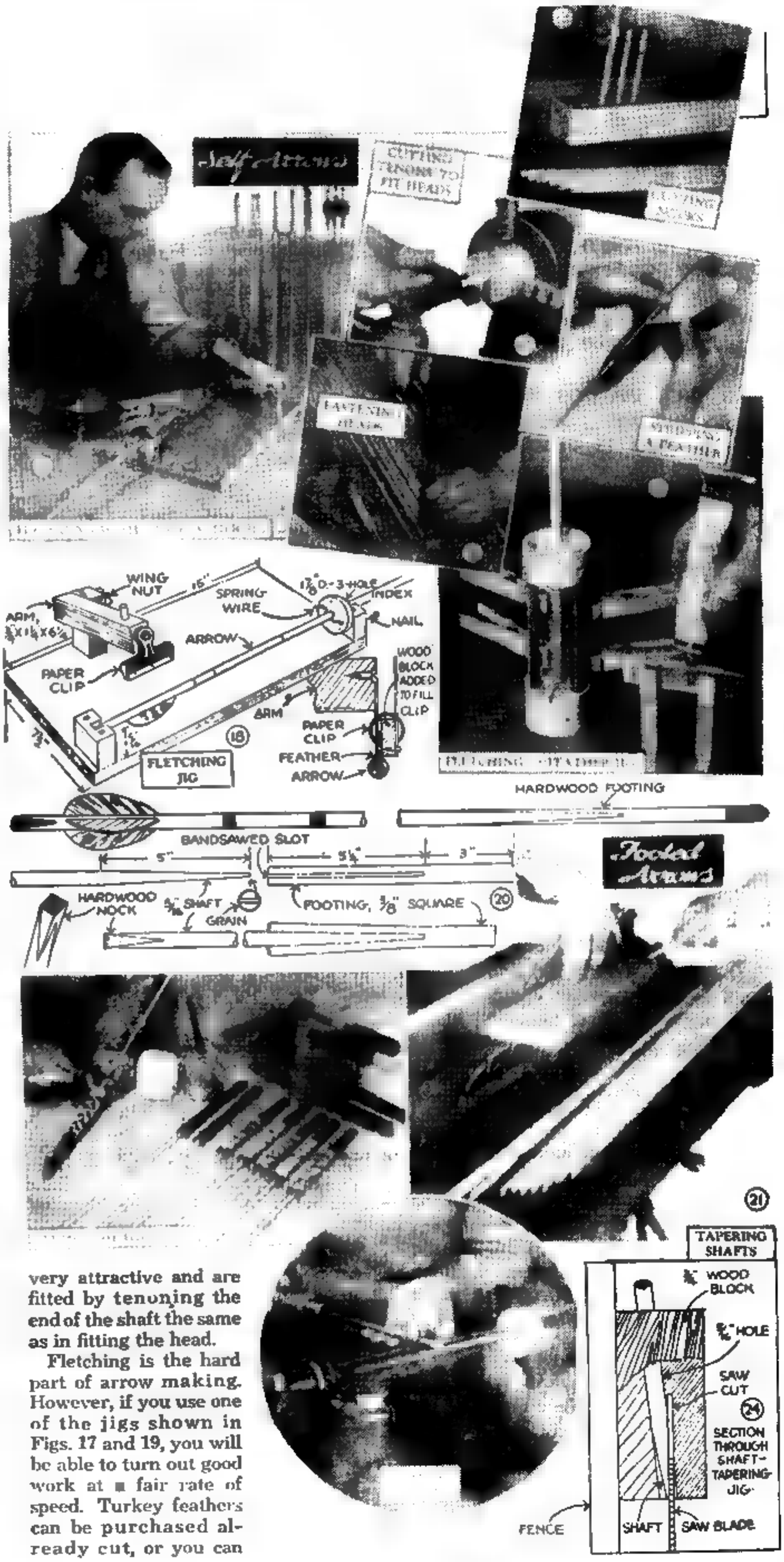
When you make your Hand Fang, test it through a cardboard box. A quick thrust will empty the needle by the harder pressure on the plunger. Unless you meant to, you'd be hard put to remove it before it was empty.

One cc of any of the poisons following this article is plenty. Also, your opponent's reaction time would prevent leaving the needle in for the full 2 cc load.

Unlike the Ultimate Fang, the Hand Fang takes little effort to make and its holder ■ made exactly the same way as that for the Ultimate Fang. (Fig. 8). It is simply scaled down so that its holding tube ■ 3 5/8 inches and its cover ■ 2 1/2 iches in length.

The hypo's needle is cut and reground, the finger holds are removed and the end of the plunger ■ trimmed ■ the way around to ■ into the CPVC tubing.

Since ■ takes more pressure to push the plunger in using the Hand Fang, the plug should be cut from a wooden dowel or plastic and glued in Even better, a 7/16 inch diameter faucet washer from the hardware store pounded into the tube ■ permanent and will never come out with normal use.



very attractive and are fitted by tenoning the end of the shaft the same as in fitting the head.

Fletching is the hard part of arrow making. However, if you use one of the jigs shown in Figs. 17 and 19, you will be able to turn out good work at ■ fair rate of speed. Turkey feathers can be purchased already cut, or you can

A hole ■ burned or drilled all the way through the end of the tube 1/2 inch from the back, as shown at the right of Figure 7, so it also goes through the plunger. An L shaped wire cut from a paper clip is thrust through so the bottom of the L stays outside. This ■ held in place by a layer of tape wrapped around the tube's end. This holds the plunger in the tube permanently.

When loaded with 1 cc, the needle projects slightly more than 1 1/2 inches from the tube and 5/8 inch when empty.

to load, use the needle nosed pliers, put the needle tip into a shallow container of poison and with the pliers holding the needle, simply pull out the hypo until the first black line ■ visible. The best way to load the Hand Fang is with a vaccine bottle. Upend the bottle and stick the needle through the rubber until you can just see its tip. With the needle nosed pliers, pull up the needle until you can see the black line and you'll have 1 cc and you'll be all set.

POISONS

The most glamorous and popular poison is potassium cyanide. You can order it from several of the chemical suppliers listed in this volume.

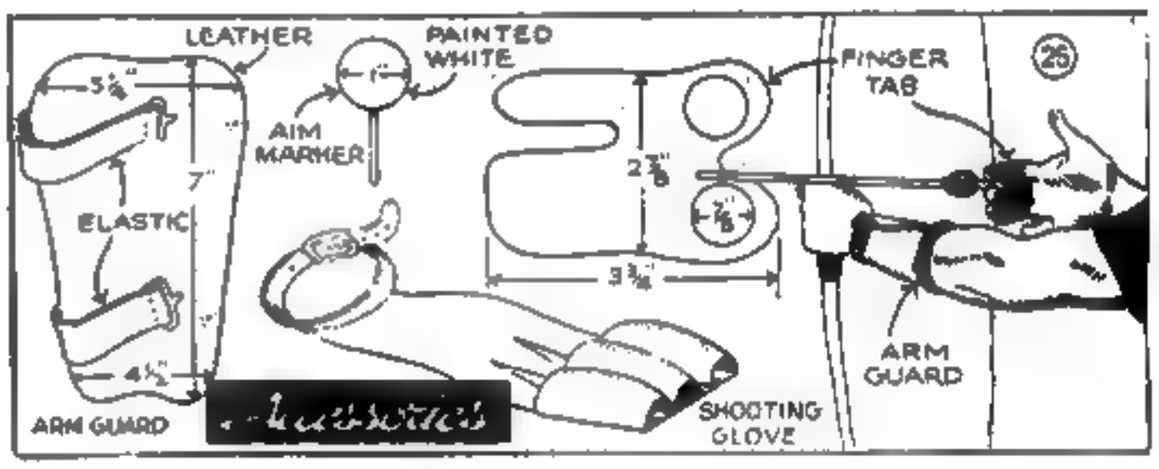
To make ■ most potent for injection, put 1/4 ounce in one oz. water and stir until it dissolves. Shake in more and stir again. Keep this up until some stays on the bottom undissolved. You now have a saturated solution, meaning the clear liquid is as strong with cyanide as it can get.

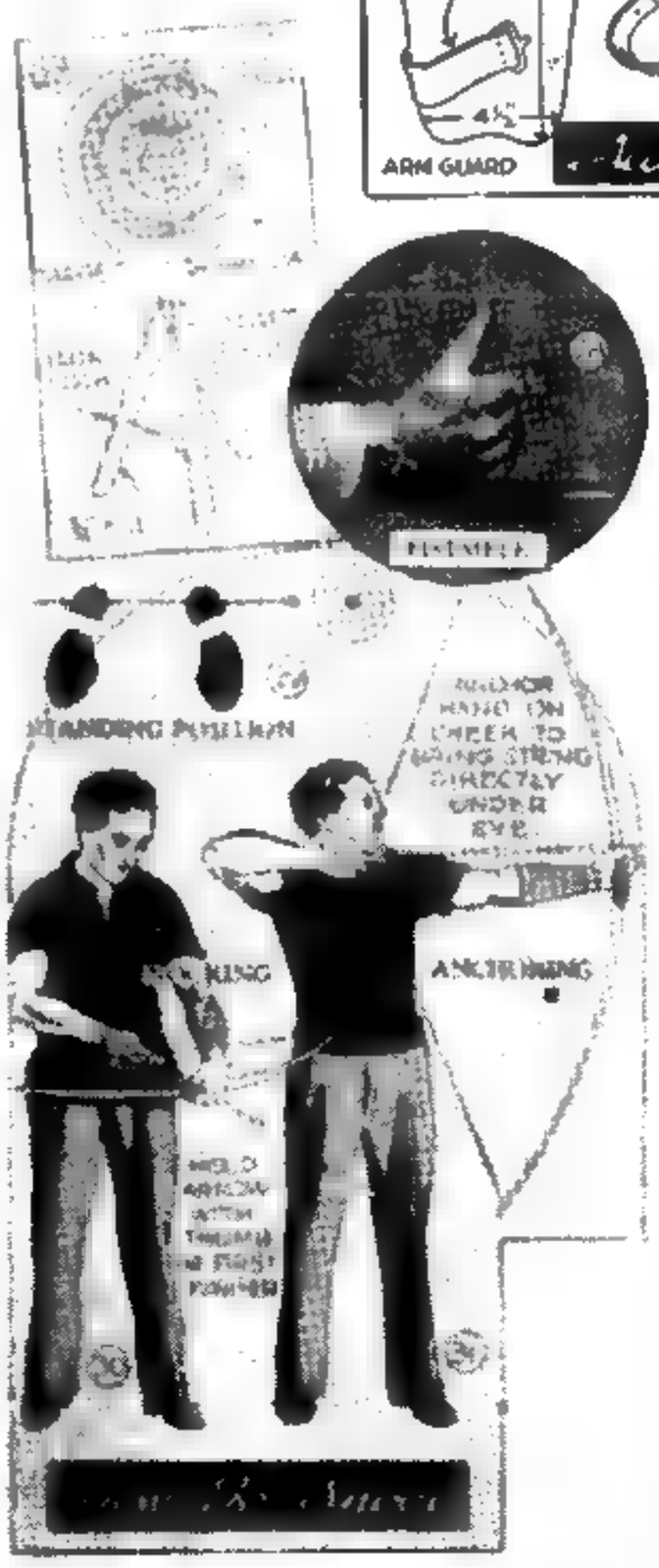
One quarter cc should do the job, but why be stingy? Give your opponent the full 2 ccs as a show of generosity.

The cheapest and most convenient poison, however, ■ simple nicotine. It can be gotten in the form of Black Leaf 40, an insecticide. It is sold for about $3.00 for 2 oz. of 40% pure nicotine in most garden sections ■ supermarkets or in plant nurseries. It

strip your own feathers by grasping the vane at the tip and pulling outward, as shown in Fig. 15, afterward cutting the vane to the required shape. The one-feather fletching jig shown in Figs. 17 and 18 is built around a paper clip. A disk of plywood, which slips over the shaft, is drilled with three small holes to supply an indexing head, and is prevented from slipping by means of a piece of spring wire. One feather at a time is clamped by the paper clip and pressed into position. Any type of adhesive can be used. Celluloid cement has the advantage of quick drying and the ability to anchor on lacquer, thus allowing the shafts to be painted previous to fletching. Waterproof glue on bare wood is the most durable. In the three-feather jig, the feathers are held between metal plates, one plate of each set fitting into grooves in the top and bottom members. The upper ring is removable, being a press fit over the three spacing dowels.

Footed arrows: Footed arrows are more decorative and more durable than self arrows. The footing is made from any tough hardwood, and is slotted for ■ distance of 5¼ in., Fig. 20. Shafts are usually Port Orford cedar or Norway pine, and are tapered to fit the slot in the footing. Perfect tapering of the shafts can be done by the circular-saw method shown in Figs. 21 and 24. The taper should be made with the flat of the grain. The shaft is assembled to the footing with waterproof glue and the assembly is then clamped or wrapped with twine or rubber strips as in Fig. 22. Other than a special tenoning jig, the best method of rounding the footing to match the rest of the shaft is by turning, Fig. 23. Nocks





for footed arrows are usually of the same wood as used for the footing. The insert is let into the end of the shaft, and is later rounded off and grooved in the usual manner.

Accessories: If you want to be comfortable while shooting, you will need an arm guard and a finger protector. Any kind of leather band around the wrist and forearm will do for the guard, its purpose being to take the lash of the bowstring as the arrow is let loose. A simple finger tab of soft leather shaped as shown in Fig. 25 will provide protection for your fingers, or you may prefer to make or buy a three-finger shooting glove. An excellent target can be made by cementing four or five layers of corrugated cardboard together, painting the rings directly on the cardboard or on a piece of oilcloth. A simple target stand is made from ¾-in. lumber, as shown in Fig. 27.

How to shoot: Stand with your feet well apart, left side facing the target, as shown in Figs. 26 and 29. Hold the bow horizontal and fit an arrow across the arrow plate. Grasp the arrow with the thumb or first finger of the left hand, Fig. 30, and with the right hand twirl the arrow until the cock feather is perpendicular to the bowstring. Adjust your grip on the string, as shown at the right in Fig. 25, and start the draw. Pull back slowly until your right hand comes to a fixed "anchor" point on your jawbone, Fig. 31. In this position, the string should be under and in line with the right eye. Aiming is done by sighting over the tip of the arrow to some fixed point previously determined as the correct point of aim at the distance being shot. Fig. 32 illustrates this method of aiming.

sold all over the Free South. Yankees and Californians can't get it because too many of them are simple and so can't be trusted with such substances. You might look for it anyway, in case I'm wrong about your specific area.

The fatal dose of pure nicotine is about 40 mg. (1 drop, 2/3 gr.), a quantity contained in 2 Gm. (30 gr.) of tobacco (2 cigarettes).

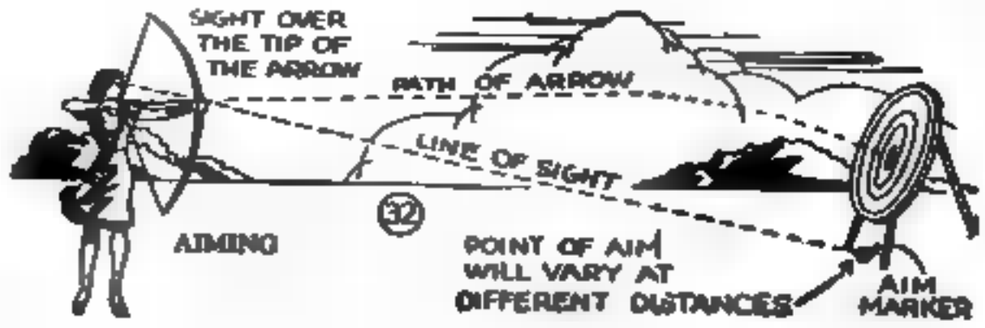
To get your own nicotine, I recommend buying a can of Copenhagen or Skoal tobacco, sold in most grocery stores. Saturate the tobacco with water, put on its lid and let in alone for 24 hours or so. Then put the soggy mass on a cloth and twist out the liquid into a small jar. Next, pour through a coffee filter to make sure there are no particles of tobacco which might clog the needle.

A hypo filled with 1 cc of this will do the job as surely as a round from a 44 Magnum.

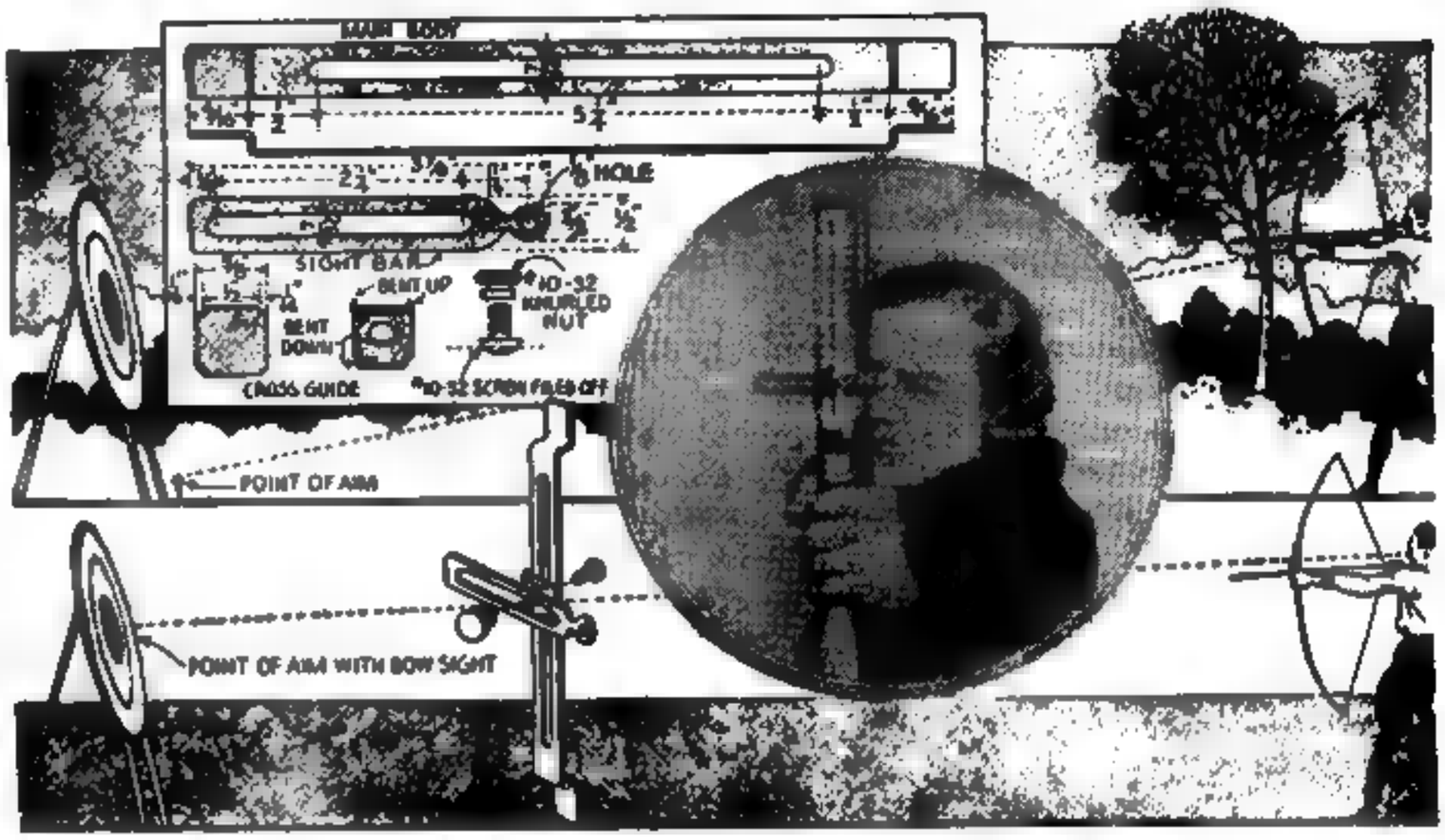
An excellent use for the Hand Fang is the injection of ricin. The Russian who stabbed the Belgian with the umbrella tip loaded with a tiny hollow metal ball filled with ricin was a clumsy jerk. He was recognized and the weapon was known. Had he used the Hand Fang, a quick thrust and all the Belgian would have known was that he'd been stuck with something but the weapon would have been concealed so fast that he'd never be sure what really happened or if the Russian had really done it.

Ricine is best used in situations where you want to be well away before your opponent shows any signs of wear. This would involve a person you know and who may know you. You don't want him to drop dead while you're anywhere in the vacinity lest a connection be suspected. But if you're at a party or in a bar where he and someone gives him a playful jab with a pin, what's to prove if he starts going to hell hours or days later?

So a good rule of thumb is; no connection known, you can drop him like a hot rock and join the gawking bystanders. You might even comment to listeners on the dangers of junk foods. But if you know him or if you are obviously political or social opposites where his destruction would reflect on you, use ricin.



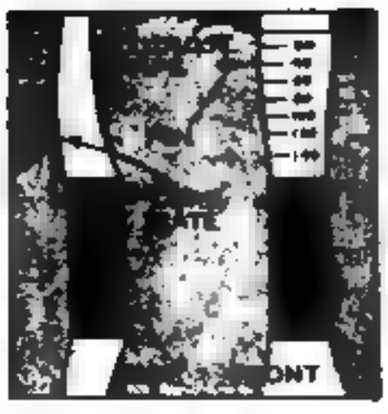
Sight on Archery Bow Improves Your Aim



Taped to your archery bow, this adjustable sight will be found a more satisfactory method of shooting an arrow than the "point-of-aim" method, as you aim right at the bull's-eye instead of sighting at a marker on the ground in front of the target. Thus, any variation in bowing or in distance is not likely to affect your aim. The parts of the sight are made of heavy sheet steel or brass and are cut to the shape and sizes given in the detail. When finished, they should be polished with fine emery cloth or steel wool. Nickel or chromium plating will improve their appearance. The sight is mounted on the back of the bow with the sight end of the cross bar extending to the left. It is adjustable either vertically or horizontally. Once set for a certain shooting distance, the sight may be marked so that when the same distance is shot again, the correct adjustment can be made without any trouble.

A Versatile Homemade Bow Sight

This simple, lightweight device has all the adjustable variations of an expensive bow sight, and with an average weight bow is fairly accurate for distances well over 100 yards. Cut from a strip of cork gasket material 1 in. wide by 6 in. long, the sight is fastened with adhesive tape to the back of the bow just above the leather grip. After gluing the cork in place, put a strip of cellulose tape on the belly of the bow opposite the cork. Stick a 2-in. round-head hat pin into the cork so that the head projects ½ in. beyond the left edge of the bow. Then, by the trial-and-error method at various distances, determine the proper position of the pin for each distance and mark these positions in ink on the tape, numbering them accordingly. A coat of clear shellac will protect both the cork and the scale.



Making Arrows Visible

To locate your archery arrows easily after shooting them, wrap bands of tinfoil on the shafts just in front of the feathers, and shellac the bands to prevent tearing. The tinfoil will glisten in the sun so that an arrow can be seen at a distance of many yards. This method is especially effective in cases where the arrows happen to fall in tall grass, weeds, etc.

ROAD BLOCK

By KURT SAXON

I'm sure you've seen movies and TV shows where road blocks are put up and the villain or hero crashes right through and gets away. This is for effect, as decently equipped police departments have portable road blocks studded with over sized spikes. For P.D.s who can't affort these or need to stop traffic immediately without calling in, you can't beat my tire shredding road blocks. They can also be used by civilians to teach treapassers the error of their ways.

All you need for 10 tire shredders is two boxes of mower blades used for hay, wheat, oats, etc., bought at any farm supply store. They come in boxes of 10 for under $5.00. Two boxes will give you 10 shredders which, after brazing, shouldn't cost more than about $25.00.

They are extremely portable as all 10 will fit into a space smaller than shoe box.

If you don't have welding gear, take them to your nearest welding shop. The blades should be placed flat side down and those used as shredders held straight up in the middle. They must be brazed as they are made of tempered steel and if simply welded, will snap under pressure. Braze all along both sides and paint whatever color you want. Before painting, grind the ridge off the top side so you'll have a razor sharp edge.

If you are a cop you might paint them fire engine yellow so maybe your quarry will see them and stop. If you are a civilian you'll want them to blend with the road you are using to trap someone.

To use, place them in a line across the expected route of the quarry with the pointed ends on the bottom facing traffic. This will shred any tire under three inches thick, which would stop just about any vehicle on the highway, including Army trucks.

These shredders are suggested for protecting your property from people who trespass just for the hell of it, to steal or to attack you. Unlike nails, which may not take effect for several yards, or even a mile or so as the air leaks out, the shredders cut through tires as if they were butter. The result is immediate and the quarry is demoralized and at your mercy.

Of course, for a civilian to put such devices on a public highway for just anybody to run over would be a criminal act and totally without class. Try not to be any more of a slob that you are. Cops must realize that since the effect is immediate and more dramatic than a nail or a simple blowout, control is gone, especially at speed.

As far as legality goes, on your own property, you must have a prominent "NO TRESPASSING" sign near a sign with your name on it. For instance, I have a big sign at the bottom of my property saying, "SAXON'S LAIR" under which is "DEAD (skull and crossbones) END."

This way, anyone who can read knows I don't want anyone around who has no business here. Even so, people will still come up looking for "Charlie", "Burt", "Clem" or whatever or they are lost tourists or delivery persons. So I only put out the shredders after dark, when the day's work is over and people aren't wandering around sightseeing.

You see, I don't want to destroy anyone's tires unless he's really asking for trouble. But after dark, anyone coming on my property unannounced is asking for it. I can legally put anything on my off-the-highway driveway I want, so long as it doesn't threaten life.

"Barbarians of the World Unite — You Have Nothing to Lose But Your Parasites!"

KURT SAXON

This editorial by the late John Campbell may be the most important one in ■ my works. It addresses itself to most of you and should help you to sort out a lot of the conflicts we barbarians have concerning our place in society.

John Campbell was a citizen type, a trained scientist and a major contributor to the field of science fiction. This editorial was taken from the August, 1964 edition of Analog.

As a citizen type, although John had barbarians sized up more accurately than any writer I've read, he was biased. He lumped para, average and sub-barbarians ■ in the same category. Nor did he see the necessity for the Para-barbarian in the transition from our foundering civilization of today to the culled and strong civilization ■ tomorrow.

My next editorial will put you ■ the picture. In the meantime, read John's editorial over several times.

the barbarian menace

John Campbell

■ A few months back I discussed here the effect that marching, countermarching, and round-and-round marching barbarian armies had had on human history. They provided Mankind with one of those great "educational opportunities"—education on the "Learn—or drop dead!" basis. This educational technique does not, of course, help the individual greatly, nor is it ever popular with the educatee, his group, or his descendants.

But education is a very strange thing. Everybody wants to *have* one, but the resistance to getting one, or having one forced upon you, is remarkable, considering how highly the thing is regarded. Practically everyone is certain that more education is just what the other guy needs to be given—but the wish for personal education is almost invariably of the form "I wish I had had . . ." The pluperfect tense—not the present-intentional, or the immediate-future tense. It's much more popular to sigh about the fact that education didn't happen years ago than to do something about getting ■ now.

Education is something everyone wants in his past—and is resisted from "stubbornly" to "violently" in the present. "I haven't the time, now . . ." is the standard excuse. Neither does a ten-year-old; just ask him. He has all those ball games to take care of, and the fishing to attend to, and a great many other important things that he needs to do. It's only that he's enslaved* by adult task-masters that forces him to acquire what he doesn't want.

*One of the commonest definitions of slavery is "being forced to labor at tasks not of your own choosing, under threat of physical punishment, while being unable to escape. If the slave escapes, he will be arrested and forcibly returned to his master." The child is enslaved!

While people look back on those horrid, awful, wicked times with loathing . . . they are enjoying the benefits conferred on us by those barbarian tactics. The barbarian armies culled out those individuals who could not learn—who did not have the flexibility that made possible a reorientation in adult life. Any cub, pup, or child can learn a new way of life; they obviously have to, for any way of life is new to them. The far more difficult thing is to learn a different way of life after you've learned one—for the Old Dog to learn new tricks. For the individual brought up as a Christian to be able to learn the new set of values the Moslem army insists on—or for the brought-up-Moslem individual to learn the values system of the Crusaders-with-swords.

This is, of course, a highly effective selective breeding system—whether the barbarian armies so intended it makes no difference whatever. It selectively bred for the characteristic of educability-and-flexibility in the descendants of the conquered peoples. And inasmuch as *no* people ever remained permanently unconquered, every group in the marching-barbarian-armies system was, repeatedly, in the class "conquered" often and long enough to be repeatedly and thoroughly culled over for elimination of the uneducable.

Please note carefully: I'm *not* saying "This is the way it should be; this is what I recommend!" I'm saying "This is in fact what observably happened."

We hear a lot of yak about behavior

characteristics, mental and phychological characteristics, not being genetically heritable. This is absolute, and completely stupid nonsense; watch the courting patterns of various birds, for instance. Or the behavior of salmon in returning to their native stream. The migration patterns of hummingbirds, or the nest-making pattern of the paper-making wasp. Each displays very specifically inherited *behavior* patterns—not merely physiological patterns.

In bees, there is an additional inherited-pattern system demonstrated; a given fertile egg can be developed into a sexless worker if fed in one way, or into a queen, if fed a different diet. Here, both physiological and behavioral patterns are seemingly determined by the diet.

Obviously, they're not; the diet doesn't carry that much information! It's a lot closer to having a record that, played one side up produces the pattern "The Pines of Rome," while, played the other side up, displays the sound-pattern of "Hungarian Rhapsody." There is, in the bee egg, a dual potential; which potential is developed into activity can be influenced—but the potential itself is genetically determined.

What we need at this point is a somewhat more precise meaning of the term "barbarian." The origin of the term stems from the old Greek conviction that anyone who didn't speak Hellenistic Greek was less-than-human—that the aliens didn't really speak, any more than dogs or chickens did. They just made mouth noises like *bar-bar-bar*, and were called *barbarians*.

So the original meaning of the term was simply "Somebody who doesn't speak Hellenistic Greek." This means the world today is populated entirely by barbarians.

Later, it meant "Any people whose culture and ways of life I disapprove of—that is, anyone who doesn't live The Only Right Way—my way!"

That's a very minor modification of the Greek meaning. It did, however, allow that someone who spoke perfect

The Citizen Menace

By Kurt Saxon

Within every organism, from the amoeba to man lies the inherent urge to develop and express all its positive traits. Normally, organisms whose negative traits predominate are culled by the environment.

In Man, pre-tribal savage groups culled those with predominantly negative traits by killing or driving them away. Except in the best of times, even those who were physically strong and mentally healthy had a difficult time staying alive. A weakling or dimwit could neither gather enough food nor defend the group. Any weakness of the individual was a threat to the group's survival.

In time, some animals and plants were domesticated. The resulting surpluses permitted the keeping alive of some who were less than adequate to the rigors of savagery. This marked the birth of tribalism.

Under the hardships ■ savagery, the only positive traits a man could develop were those which simply made him a better hunting animal. Tribalism, with its basic organization and cooperation, could have brought about the development of the higher traits we value in individuals of accomplishment.

But under tribalism, the development of superior traits among individuals was discouraged in favor of conformity to group dictates. Such dictates were usually for the benefit of the chiefs and the priesthood.

■ a superior tribesman could carry out his duties better than his peers, he was honored. If, however, he sought to introduce progress beyond the capacities of the group, he was considered a threat. Ideas demanding higher intelligence to implement threatened the value of the less intelligent. Also, those in authority wanted a system only they could manipulate and control. ■ the ideas of the superior individual demanded the selection of more intelligent people, the leaders were threatened. So under tribalistic dictatorship, higher individual traits went undeveloped, lest the people become independent of their mediocre rulers.

An important sidelight to the development of social structure and the repression of individual development, was organized religion. The savages' angry storm gods and gods of the hunt were largely replaced by tribalists' fertility gods. Rituals placating and serving these gods marked time between planting and harvesting. As the approaching seasons came to be marked by stars, the Earth gods were kicked upstairs where they watched over everything from "Heaven."

As tribalism and religion developed, traditions and taboos largely replaced nature as the culling agent. The traditions and taboos were mainly to insure that the work got done. Those who did not follow tradition and broke taboos were gotten rid of. It would be a long time before written records and intelligent observation did away with the need for tradition, and all the gods ever dreamed up could be replaced by an almanac.

Under tribalism, individual responsibility was neither encouraged nor wanted. Harmony and a continuation of a system that worked for the group was dependent on obedience. Tradition and religion governed every action. Under such a system, there could be no individuality, thus no innovation, hence, no progress.

Enter the barbarian. I like to think that in most cases he was one with a mind of his own who refused to take orders from superstitious, tradition-bound fools. He would not drudge from sunup until sundown with no expectation of personal reward or advancement. ■ he lacked creativity it was probably because the system stifled it.

Having been driven from the tribe because of nonconformity, he probably

Greek could be a barbarian. This meant that, as any Athenian could clearly recognize, Spartans were barbarians, even though they did speak Greek.

To a very large extent, the term "barbarian" ■ used today in precisely that way; ■ has no precise meaning, and is solely a term of disparagement, a term of insult.

I want to make a precise definition of the term, one that will make it useful in discussion—which no vague, variable-referent term can be.

Let me hasten to point out that vague, variable-referent terms can be extremely *satisfying* in discussion; they simply aren't *useful*. That is, if we have "barbarian" as a vague, variable-referent term meaning "someone whose manners, customs, appearance, language, or values I dislike because they are unlike mine," then if I say, "I don't like that man," and you ask me why, I can, with satisfying sense of conviction and completion, say "Because he's a barbarian!"

This is very satisfying; it gives one the impression he has said something meaningful in explanation of his dislike. That he has made a profound, and definitive statement. It's satisfying.

It's also perfectly circular. "I don't like him because he acts in a way I dislike."

Let's try something more definitive, and acultural—use actual, observable behavior characteristics, as describing the barbarian. Animal species can be defined in terms of behavior characteristics, as well as in terms of physiology; so can human types. Some animals are carnivorous; some, although perfectly capable of digesting meat, never eat it. These behavioral characteristics are perfectly definable and observable.

First, there is the Tribal type—the earliest human-cultural evolution. The term "savage" can be reserved for the pre-cultural level, the level when humanoids wandered about in family groupings, as do chimpanzees and gorillas today.

joined with other outcasts of his kind. Then, I like to think he took the men back there, knocked off the chief and made himself king. My kind of guy!

Our barbarian king would not have been a social reformer. He was ignorant and primitive and would have had no standards of comparison. While in the tribe, he would have been rejected by the haves and have-nots alike. Under the circumstances, he could not have felt responsible for anyone in the tribe except, possibly his immediate relatives.

No, his only real responsibility would be to those who had supported him in the takeover. All any in his group would want was as good a life as the tribe had to offer, and then some. The only reorganization would have been directed toward improving his own position.

He had been expelled by the priesthood and the now dead rulers. He would have had no awe of the priesthood, since their magic had been no bar to his takeover. But since their mumbo-jumbo served to keep the people in line, he would have kept them on. However, they would have been demoted to positions where their influence would have been primarily over the brutish majority, much as today.

Had the takeover been by the tribal soldiers, they would simply have looted the treasury, killed all those who had opposed them and imposed a military dictatorship. The general might then have attacked surrounding tribes for more loot.

But this isn't barbarism, as such. It's just opportunism by the strong over the weak. The general is still bound by the old superstitions and taboos. Some overall change might come as a result of social intercourse with the conquered tribes. Such basic cultural evolution is not a product of barbarism.

Our barbarian king wasn't interested in cultural evolution. Nor did he want revolution. He just wanted to take over the system and make it work to his advantage. In doing so, he created our modern Frankenstein, the citizen.

The citizen was but one step above the tribalist. He could go along with the traditions, rituals and taboos and sublimate his own will to that of the group. But he was superior in that he was adaptable. He could accept new ways, new ideas, and build on them.

The tribalist was not adaptable. What he had been taught at his mother's knee, by his priests and chiefs, was written in the stone of his calcified brain. He could not change.

The barbarian abolished those aspects of the system which had restricted him and kept him from fitting in. This also freed the citizen to develop and express his own positive traits and civilization was born.

So the barbarians, world-wide and throughout history, broke the restraints imposed by the weaker and closed-minded tribalists. The citizen types, freed to create and build, mainly for the benefit of their barbarian conquerers, spelled progress for all who could handle it. This also made room for many of those who could not handle progress. But more about this later.

The above is, of necessity, a broad generalization. Culture, environment, climate and various other factors also determine radical change. Basically, however, the dramatic interaction of tribalist, citizen and barbarian depends on a relatively stable, but stagnating social environment. Without the interference of barbarians, stagnation leads to decline and fall, as exemplified by the Egyptian and Chinese dynasties and the Roman Empire.

Before going on I'll give my definitions of the four types and how they interact with modern society.

First is the savage. Originally, he was the pre-tribal forager and food gatherer. As he evolved and gained skills, he developed crude weapons and became primarily a hunter of game. Life was hard for the savage and compassion as ■ concept was unknown to him, since its implementation requires a surplus of food and/or effort the savage lacked as a matter of circumstance.

Until cooperation in cornering game evolved, his fellows were only of value

The Tribal type evolved through the evolution of Tribal cultures; the human type and the cultural structure were, of course, co-evolving as a feedback-interacting system. The resultant human type is characterized by rejection of creativity, and by complete rejection of personal responsibility. The Tribal rituals determine all Right Living Ways; he is not responsible for anything, so long as he follows the commands of the Tribal rituals. He accepts external command—and is rewarded with security. If he obeys the Tribal rituals, the tribe will defend and protect him.

The Tribal type readily accepts slavery; the Master simply replaces the Tribal rituals. The Master now gives the commands, which the slave—better, actually, is the term "serf"—obeys faithfully, and the Master rewards the Tribal individual with security, freedom from responsibility, and the benefits accruing from sharing the higher standard of living the wiser Master can produce.

In Tribal culture, the cultural system is wiser than the individuals, and precisely that situation above described results. The tribesmen don't know why the rituals are what they are, nor do they feel they need to understand; they need only carry out the orders of traditions, and they will benefit from the greater wisdom of the ages.

The second major stage of cultural evolution came with the rise of the barbarian.

The primary change came in the fact that the barbarian accepted personal responsibility. The consequences of that are very complex, very interesting, and pure dynamite culturally. Since he takes personal responsibility —he won't take orders. He won't obey the rituals; if he does something somebody else tells him to, he does it not because he's ordered to, but because he believes, himself, that doing it is a good idea.

With the rise of personal reponsibility came, as an obvious consequence, what we know as Honor, personal

helping to find food and mutual defense against other savage groups. His mate was only of value in helping with the drudgery and rearing his young. Only when primitive forms of agriculture and the domestication of animals evolved could the intelligent savage graduate to tribalism.

In the last editorial, John Campbell was wrong in labelling the North American Indian as barbarian. First, there were dozens of groupings and subgroupings. Many of them had agriculture and domesticated animals and had therefore advanced to tribalism. Many others, however, were only hunters and food gatherers and so were savages.

Species evolution also plays a large part in the differences between the Indians and their European invaders. During the last Ice Age, about 15,000 years ago, water levels were lower, due to the accumulation of ice covering the planet's land surface. Primitive Asiatics crossed the then dry Bering Strait and moved into the American continent.

Thus cut off from the interaction between diverse cultures in Asia and Europe, they remained at a Stone Age level of development. They knew nothing of metal working and so worked with stone, saplings, skins, bone, etc. They never used the wheel and their only pack animals were dogs and squaws.

At the coming of the White man their intelligence was lower than his. Their primitive social systems required only strength and agility on a day-to-day basis. Abstract intelligence serves little purpose for survival on such a level.

Thus, natural selection chose the physically strong and the agile to survive. Intelligence beyond that needed to outthink a bison was no more necessary in the matter of selection than was artistic ability. In all life forms, intelligence is only a tool. It simply doesn't enter into the process of natural selection unless it is critical to survival.

Many Indian groups were quite civilized, such as my ancestors, the Cherokee. Even before the coming of the Whites, they were farmers and lived in log homes. They were intelligent and most had evolved to the level of citizen. Individualists with a healthy streak of barbarism, they sided with the British during the Rebellion and fought on both sides during the Civil War, the southern faction including many slave owners.

But for John to label pre-tribal savage Indians "barbarians," contradicts his own definition. Indians at the tribalist level were enslaved, not by Whites, but by other Indians. Savages such as the Sioux, Comanches, Cheyenne and Apaches could no more be enslaved than could wolves or coyotes be broken to herd sheep. They had neither the intelligence nor the social maturity to be pressed into any useful occupation, even to their own advantage.

Incidentally, over the generations since the Whites came here, most ■ the savage Indians were wiped out. Their deecendants have, through natural selection, evolved to tribalism.

The modern savage is as primitive and useless as the original Apache. He is, invariably, a predatory criminal. Muggers, armed robbers, theives and suchlike are savages.

Like the primitive savage, he gathers and hunts, but among the populace. Like a small child, he takes what he wants, giving nothing in return. Thus, he ■ a total predator, a criminal with no value to society. Once his actions have become recognized as a habit pattern, he should be sterilized and isolated or destroyed.

The savage personality is a genetic throwback ■ the Stone Age. He ■ like a child who has not grown mentally above the age of four. Whether his savagery is an actual genetic defect or a result of Minimal Brain Damage, he is seldom worth any efforts toward rehabilitation. (read "Minimal Brain Damage," Vol. 1, page 57 of THE SURVIVOR).

John Campbell's definition of the tribalist is as accurate as any I could give. But with his definition, one can hardly escape the image of a skin-clad primitive

honor. A tribesman doesn't have personal honor, because he doesn't have personal responsibility; breaking tribal taboos is evil, sinful—not dishonorable.

Every organism must seek survival of its type; if ■ doesn't, ■ is of no importance whatever in the scheme of things. For it's not long for this world, if it doesn't seek survival! "Security" ■ a generalized term, essentially meaning simply a sense that survival ■ assured. Where the Tribal type found security in the ancient, stable, wisdom of the rituals—or finds it in a Master who orders him, and takes responsibility for him—the barbarian is his own source of security.

Actually, of course, a sense of security has nothing whatever to do with actual safety. For example, there's nothing like a good, solid lethal dose of morphine to make a man's worries and fears ease away. A cat might well curl up comfortably on a nice, warm mass of radioactive matter, thermally content while the gamma radiation tore ■ to pieces.

The barbarian takes personal responsibility—and his security lies in the absolute, unshakable certainty that he is Right, Wise, and Capable.

This makes it exceedingly difficult to teach him a damn thing. Since he's already Right, obviously he has nothing to learn—and if he isn't right, you've just destroyed his sense of security. To accept that insecurity means, to him, that he is lost without direction, without a way to recover himself.

He has a strong sense of *personal* responsibility . . . but no great sense of responsibility for others. Fellow barbarians not only don't ask him to take care of them, they'll damn well kill him if he tries to take them over. And you *can not be responsible for something, or someone, you have no control over.*

The barbarian type evolved, and evolved civilizations. They demean the tribal type—those cowardly, subhuman slaves, who will take orders from another man! They know that

trapped in a particularly rigid caste system.

Instead, imagine our tribalist in modsern dress, driving a Chevrolet to his job on an assembly line. Although some tribalists may be intelligent, the average is dull normal.

Tribalists are owned by their respective societies. They maintain the system in the push, pull, lift categories of labor. They have as many children as biology allows and eventually swamp any system with their incompetent strain of homo sapien.

A system which has matured to where automation and computerization ■ its maintenance does away with the need for these dimwitted brutes should sterilize them out of the species. But just the opposite happens. They are honored as humans. They are nurtured and cared for at staggering public expense, along with their blighted young.

Without the increasingly dependent tribalist, the citizen and the barbarian could use our surpluses to create a progressively refined utopia. But not only the surplus, but the system's working capital ■ squandered for their upkeep. This beggars systems and keeps them on a constant war footing as each system competes for resources to maintain their increasing burden of increasingly parasitic tribalists.

The tribalist is fixed in a state of arrested adolescence. He does not have the mental equipment to work without supervision or to accept responsibility, since he is but a cog in any work situation.

Now we come to the citizen, supposedly the pride of the system, but in actuality, its most serious menace.

The citizen is generally supportive, adaptable, creative and the real mainstay of any system above the agrarian. The citizen's flaw lies in his identification with the tribalists. He is reared with the attitude that he must protect and sustain his less fortunate brothers. Their religions and traditions are part of his programming, for better or for worse.

As John Campbell says, the citizen is only one step ahead of the tribalist. Not nearly far enough ahead for him to discount them as necessary to his fulfillment as a human being. They are the foundation on which he builds his life and so the citizen is too often incapable of rejecting them.

"All men are created equal," "We are all in this together," "The brotherhood of man" and other negative populist attitudes are the guides by which he is literally enslaved by his inferiors. He believes that they are his natural responsibility.

Neither the savage, the tribalist nor the barbarian really identifies with those who are of no benefit to his progress in life. In truth, they all see society's losers as competitors, simply using up what they feel they deserve or could earn without unfair competition from those who have nothing but needs.

But to the citizen, the inferior is a sacred burden; a trust. The citizen is thus challenged to perfect a system kept imperfect by hordes of parasites. The attempt is always at the expense of the competent and simply delays the inevitable. And the inevitable is either a nuclear culling or a coast-to-coast New Delhi or Calcutta.

The chickens have finally come home to roost and our system ■ in serious trouble. No system so overburdened with social dependents and run by mediocrities can long prevail. Not only our system but every diverse system on our planet is failing to cope with the realities of natural law.

In our country there are nearly 250 million people. Nearly 50 million ■ our work force of 100 million are Federal, State or Municipal workers, paid out of taxes. Only about 60 million workers are depended upon to pay for the upkeep of our 80 million-plus, social dependents on welfare, medicare, Social Security and various pension systems and subsidies paid for by an ever decreasing number of productive workers.

Like herds of any of the lower animals, the populations of our planet have

they, and only they, are Right and Wise.

Characteristically, the barbarian *cannot* work for a living. It's psychologically impossible for him. He can, and will, fight for something he wants; that's honorable. Any form or variation of fighting is good, honorable, and manly. He can fight with swords, spears, or machine guns, or with arguments, or schemes and plots. He can get what he wants by threats, blackmail, extortion, or gift. (Which he considers a form of extortion; obviously the giver feared him and his power.) He can plot, scheme, and labor at a plan ■ gain his ends—but he cannot work for it.

He can risk life, health, or crippling, labor twenty hours a day for weeks digging a tunnel to penetrate to someone else's treasurehouse; that is honorable, manly, tolerable because it's a form of fighting. But he can't work in a mine to dig out gold from Nature's treasurehouse; that's unmanly, demeaning *work*. Work is what slaves and women do. An honorable man can hunt, fight, and plot—but not work for economic productive ends. Only slaves and women do that.

The European nobility, until relatively recently, held precisely that attitude; it was demeaning and dishonorable for a nobleman to engage in trade—i.e., to do anything economically productive.

The American Indians, when white men first arrived in the United States area, were true barbarians. They did not, *and could not*, work for a living. The colonists confused them acutely, because they worked for a living . . . and a few preliminary skirmishes established very definitely that the colonists were not cowardly weaklings, not the demeaned slave type.

The colonists, however, found that the North American Indians could not be enslaved; the Spanish tried it, and were murdered for their pains. In the United States central and eastern areas that is; in the Mexican-to-Chilean areas, the Indians had advanced

simply outbred the carrying capacities of our planet's social, economic and ecological systems.

There are nearly five billion people on earth. Not only are there too many people, but most of them are not up to meeting the challenge ■ enlarging the productive capacities ■ our systems.

Intelligence and overall competence is declining disastrously. Even our mediocre politicians are protesting our frivolous, silly, and imbecilic students and our schools, which do little more than babysit those unable to learn useful skills.

Something has to give, and as with every past overburdened and unbalanced system; the bell is tolling.

Today, over 40 wars further ravage the Third World. Destitute refugees from war and economic prostration are beginning to swamp the economies of every industrial nation.

Whole towns are evacuated because of chemical pollution. Acid rain, a result of manufacturing for so many people here and for export, costs over two billion dollars a year ■ the U.S. alone in erosion of our buildings and monuments. ■ also destroys all life in many of our lakes and streams and even denudes our forests and threatens our croplands. Added to all this, the weather ■ increasingly turning on us, destroying homes and businesses as well as croplands.

No one who can read this has failed to see the degenerative processes shown in living color on every news program.

Most positons of authority on this planet are held by citizen types. Seeking only stopgap solutions and then only for their own dependents, world citizenry has become an actual threat to the species. Politicians, doctors, lawyers, bureaucrats, society's fair haired boys, are actually the most dangerous enemies of the species today.

Take for example, the most respected citizens ■ our society, the doctor and the lawyer. Medicine and law require the highest intelligence, on the average.

The kindly doctor occupies himself largely with saving those whom Nature dictates should be taken out of the gene pool. The doctor, however, fights Nature by improving the chances of the genetically blighted long enough for them to pass their defective genes to the next generation.

Progressively, generation by generation, doctors have lowered the quality of the species. Moreover, their work among the underachievers has simply served to swamp society with a perpetually expanding population of dependents.

Medical missionaries have wiped out epidemics in the poorer nations which had, up until then, served as culling agents. In taking away these natural restrictions to unwanted population growth, doctors have caused far more suffering than had they let well enough alone.

Whereas there was some suffering, now it is universal as those saved from Nature's culling agents have proliferated to an alarming degree. Thanks to our citizen doctor, malaria no longer takes one out of ten. Instead, about eight out of ten are in danger of outright starvation.

And so they film mobs of pot-bellied, fly-blown African children, just waiting to die. Meanwhile, their tin-pot dictators organize the starving adults to war against the surplus populations of their neighbors.

I don't mean to give the impression that any preventable suffering is acceptable. Doctors must relieve suffering and promote the physical and mental wellbeing of everyone. But the price for the care of the underachievers and genetically blighted should be sterilization, for their benefit and that of the species.

The citizen lawyer must guarantee a hearing and justice for everyone ac-

to the third stage of cultural evolution —the citizen stage—and could be enslaved. Because a citizen can work for a living, and be creative, and be responsible for himself.

So the primary characteristics of the barbarian are that he is intransigently sure of his unarguable rightness, and that he cannot work for a living, but can only fight—in one variant form or another—for what he wants.

The third level of cultural evolution so far is the citizen; he differs from the barbarian thanks, largely, to the barbarian's millennia of tutelage in "How To Learn a New Way Of Life . . . or Die!" The Citizen is marked by a flexibility of thought, of value systems, and of learning-processes that the barbarian doesn't have. The citizen can work for a living—he can be economically productive. (The barbarian can be an artist or an armorer, incidentally, but not, for example, a farmer, a machinist, or a chemist. The artist is expressing his own opinion; the armorer is making the sword he plans to use.)

The citizen is able to consider and evaluate someone else's ideas, as well as his own. He not only has a sense of responsibility for himself, but feels responsible also for others. And the citizen is the first level of humanoid that has been able to *live with a sense of insecurity*. He can think, and *not be sure his thinking is necessarily right.* This is what makes it possible for even an adult citizen to learn an entirely new way of life, even one he does not want.

Now comes the truly important problem—the true Menace of the Barbarian today.

The Barbarian is not adaptable, has no sense of responsibility for anyone else, and wants to fight, not work, for a living.

A barbarian is *not* necessarily a stupid lout by any means. That behavior pattern can apply to any individual, without distinction as to race, creed, color, or I.Q. The barbarian

cused of a crime. But all too many lawyers are merely apologists for criminality. The criminal is the hero, noble but underprivileged, his every rotten act a protest against a system which took away his birthright. So conscious of his rights are lawyers that lest any injustice touch him, the suffering and/or death of his victims must be ignored because of meaningless technicalities. As often as possible, he is released to repeat his crimes and worse, to reproduce his criminal kind. The lawyer not only protects many savages from justice, but further pollutes the species with an atavistic breed an outraged society would do better to exterminate.

So the doctor and the lawyer, the most admired of our professional class, are actually trained to save the worst at the expense of the best. As a group, they are a tangible threat to the species itself.

Of all the citizens who are well-meaning but destructive to the species, politicians are the worst. These vermin are usually well educated, however stupid, and fanatically dedicated to getting re-elected.

Since their terms are from two to four years, they don't need to plan far ahead. No matter what waste and misery their re-election boondoggles cause, they seem to honestly believe they can iron out any difficulties after their re-election. If they fail, they simply say the measures were necessary because of the mess created by their political opponents.

As an example, note the massive shoring up of our fractured economy by our super citizen President Reagan. The 1983 bill for Social Security, medicare and various other useless domestic programs cost the taxpayer $479.8 billions. Estimated costs for insuring the loser vote in 1984 is $493.9 billions. What with the mounting deficit and the ridiculously expensive social programs, if the economy makes it through the next election, inflation will wipe us out.

The reasons for these costs are the citizen's identification with those he feels obligated to preserve; the unfit and the unnecessary. The political citizens' present pet project, "The right to life," shows how even compassion can be perverted.

Only Nature determines the right to life. All the citizens' efforts to prolong useless life or to bring more of it into the world simply leads to perpetual suffering and waste. But prolong it they will, and usually in the name of Christianity.

I'd have no complaint against Christianity if its adherants stuck to its original format. It was simply a prepartion for an afterlife with rules of conduct concerning people already here. But when any religion is used to add genetic and social defectives to our culture and species, it bears re-examination.

There are literally millions of unwanted children in the U.S. who are physically and sexually abused, poorly clothed and inadequatedly fed. If the Christian political citizen were truly compassionate, he would address his humanitarian efforts to this sector.

The pious hypocrite, Senator Jesse Helmes, shows no compassion for live children. His efforts go toward adding more hungry mouths and abused bodies to our welfare roles. He believes that the abortion of unwanted and therfore automatically rejected children born to usually defective parents, is murder.

Although Helmes' Bible doesn't mention the willful termination of pregnancy, this redneck Jesus presumes to speak for his god. He does so out of ignorance of the subject.

Exodus 21:22-23 says:

22 If men strive, and hurt a woman with child, so that her fruit depart from her, and yet no mischief follow: he shall be surely punished, according as the woman's husband will lay upon him; and he shall pay as the judges determine.

23 And if any mischief follow, then thou shalt give life for life, ...

In short, if a man causes a woman to miscarry and lose her child, he is simply fined. If "mischief" follows, which could only mean the death of the woman, he dies.

So the writer of Exodus obviously didn't consider the unborn fetus to be a

can be enormously intelligent . . . and still be a barbarian as specifically defined by the behavior pattern given above.

Perhaps the all-time high example of a true, high-intelligence barbarian was Socrates. That may sound outrageous—but run it over for data! Socrates *would not* work for a living; his wife and children got along as best they could, for he had very small sense of responsibility toward others. (A man can *talk* a fine game, and not be able to play it at all. I learned a lot about the fundamental nature of ethics, morality, and honesty from a man who's an amoral psychopath; he could consider these matters with a degree of objective detachment I hope never to achieve.) Socrates could fight endlessly—argumentatively, or as a warrior against Sparta. But he did not engage in any economically productive activity, except bumming from his friends. He was intransigently and unshakably certain he was right; he "had a demon who told him" when he was right.

Socrates showed every characteristic of the true barbarian personality pattern—and the fact that he was enormously intelligent has nothing to do with that fact.

On the other hand, Aesop, who was a slave, showed the pattern of the true citizen. He was highly intelligent also —but that is a completely independent variable; citizens can be low-grade morons, or ultra-high geniuses. Aesop, however, could adopt many viewpoints, many value-systems, as he did in his fables. And he could accept slavery, and still remain mentally sound and accomplish things.

The barbarian is the greatest menace to civilization today because he is inside, not outside, the culture. The barbarian can be intelligent, can plot and manipulate with immense skill . . . and utter self-centered trickiness. He has a strong sense of personal honor—which includes the honorableness of being too tricky for your opponents to trap. The barbarian's sense of honor is powerfully dominant over his ac-

living being with a soul, regardless of its potential. Otherwise, the man causing the miscarriage would have forfeited his life. If the Bible was inspired by the Creator, then the Creator doesn't consider the unborn an entity but only a potential shell or vehicle for an entity.

My editorial on page 57, Vo. 1, of THE SURVIVOR showing diagrams from Psychology Today proves a child is not human before its brain cells are properly linked up. Before then, humanity, the level of consciousness and awareness which differentiates us from the lower animals ■ impossible.

So neither the Bible nor science supports the idea that the unborn are "human," despite their potential. So to force an ignorant, impoverished and usually defective woman to complete an unwanted pregancy ■ not only cruel and inhumane, but an injury to the species. (See ANTI ABORTIONISTS, RIGHT TO LIFERS OR GUARANTORS OF DEATH, page 455, Vol 3 of THE SURVIVOR).

Jesse Helmes ■ too ignorant of the Bible to be a spokesman of its tenets. His only real link to Christianity is in the Bible belt where he solicits the votes of the uneducated. But like most citizen politicians, this short-sighted monster considers himself a true humanitarian while causing untold harm both to children who ought not to be born, and to the species itself.

Another citizen actively threatening the species ■ the real Adolph Eichman among American politicans, President Ronald Reagan. (In case you are unfamiliar with Eichman, he was a German concentration camp commandant accused of imprisoning many innocent people under particularly brutal conditions).

During the '60s I had occasion to talk several times with George Lincoln Rockwell, leader of the American Nazi Party. He was quite intelligent and a true barbarian, albeit of a negative strain. However, he was no more a National Socialist than my dachshunds and was so vulgar he could never have attracted decent barbarians who would actually implement whatever system he might have settled on had he not gotten shot.

Anyway, once we were talking about the treatment of felons preying on society. We agreed they should be destroyed. Then he cited special cases such as those convicted of crimes against children. I was almost shocked by his plans for them. He would have had their arms, legs, eyes, eardrums, tongues and sex organs surgically removed. Then, fed intravenously, with waste tubes attached, he would have simply put them on shelves and let them meditate on their sins for however many years they had left.

Ronald Reagan is worse in actuality than Rockwell was in his fantasies. Rockwell's victims would have been deserving of extreme punishment, but Reagan's are totally innocent children.

About a year ago a child was born with part of its internal organs outside its body. It was hopelessly retarded and had no potential for growth and development. For the duration of its futile existance it would have been a vegetable with no brain in which to store knowledge or with which to communicate.

Imagine you are totally wiped out with alcohol or drugs. You're still ■ there but the impressions you get through your brain are totally distorted and any communication you might want to make ■ unintelligible. You'll be all right tomorrow, but what if that was to be your permanent condition? Who would have the right to condemn you to such imprisonment for the rest of your life?

Or say everyone was allowed only one automobile for life? What if you get a lemon? There you are, barely able to chug out of your driveway, a constant traffic hazard with no brakes, horn, barely functioning engine. You couldn't go on the freeway and, while everyone else was out there tearing around, you would spend the rest of your days in some garage or body shop. Wouldn't you rather junk the car and take any other alternative?

tions—he will kill himself for honor. But ■ doesn't happen to include honesty as part of honor.

Honor, to him, is achieving a high standard of living by fighting for it; dishonor is working for a living. (This may be a very subtle point to an outsider; Socrates would have been able to teach at a university without considering that he was demeaning himself by working—but wouldn't have been able to accept a job with a corporation ■ a mathematician.) A shyster lawyer can be a barbarian; typically, to him, the law is a system of strings with which to weave traps for others.

The menace arises from this factor; he has a sense of honor, but no sense of ethics, and no adaptability. The citizen is the type that builds civilization; the type that can work productively, can adapt his views so that he can integrate and work with others who have different viewpoints, different ways of life, different value systems.

The citizen *can adapt.*

The barbarian *can't adapt.*

When citizen and barbarian come into conflict within a culture—it is inevitable that *the citizen will tend to adapt to the barbarian because he, alone of the two, can adapt.*

The citizen will learn barbarian manners from the barbarian; the barbarian will learn nothing from the citizen.

But the barbarian will learn how to defeat his enemies—the citizens. He'll learn how they can be tricked, cozened, argued into corners, and conned into nonsense. He, who doesn't have any sense of responsibility for others, will keep assuring the citizen that *he* must feel responsible for others.

The barbarian won't work—and will insist to the citizen that citizens should feel responsible for the unemployed barbarian, and should support him in the style he'd like to become accustomed to.

Hitler was a barbarian; the Anglo-French leaders were citizens, and were conned into giving up Czecho-

Back to the blighted baby; it had been the practice that such babies were denied nourishment so that they would die. Humanity dictates that such babies should be given a shot of something rather than add to their misery through starvation and neglect.

But that's not the real point. The real point ■ that some Goody-Two-Shoes degenerate in the hospital was able to attract Reagan's attention to the fact that the baby was being written off. So our monster on the white horse decreed that all such babies should be kept alive no matter what it took, even if such prolongation of useless misery beggared the parents or cost the taxpayers literally millions of dollars.

You must have seen films of the Baby Jane Doe a while back. Her non-functioning brain was three times normal size, she had no eyes and her little limbs would never let her move about or grasp toys she couldn't have seen anyway.

Surgery might have kept her breathing for years and her parents were against it. But they had no say in the matter. Reagan and his ilk would not only put the burden of permanent misery on the baby, but force the parents to care for it to the exclusion of healthy children. Luckily, it died.

Regardless of what you might think of Rockwell, his victims would have been criminals. Reagan's victims are innocent of any wrongdoing. So who is the more callous, Rockwell or Reagan?

Nature, or God, if you will, has set laws by which physical organisms function for the benefit of the individual and the species. If the organism ■ non-functional, natural law decrees it must be eliminated. But Reagan has outlawed Nature, or God.

It is necessary and normal to show love and compassion for the helpless. But the policy of saving genetic dregs imposes an unfair burden on the families and the taxpayers. Worse, it often preserves genetic defectives long enough for them to further pollute the gene pool, the most valuable asset of the species.

If you examine most of the problems threatening today's systems, you'll find Goody-Two-Shoes citizens behind them. The citizen is invariably trapped into a belief system which gives him a god-complex concerning his lesser endowed fellows, the tribalists.

Of course, the citizen is also the greatest exploiter of the tribalists. Through his religions, politics and economic systems he has enslaved nations while enforcing the tribalist's concept of the greatest good for the greatest number. That concept works only through the individual's freedom to develop and express all his positive traits. But when it enslaves the individual of quality to the physical needs of those born to no purpose, it becomes a tyrannical waste of both valuable people and unrenewable resources.

Enter the barbarian:

John Campbell gave a very good description of barbarians. but he tended to lump the superior barbarian in with the inferior savage. Thus, although he credited the barbarian with the qualities ■ personal responsibility and honor, he still labelled those of savage behavior and characteristics as barbarians.

You can't have it both ways. The savage ■ the most primitive member ■ any society. His brain is either unformed or warped so he is unfit for sustained effort on his own behalf. Therefore, he has no choice but to reach out and take.

The savage is inferior to the task of contributing to the needs of the tribe so he ■ worthless to them. Of course he has no sense of personal responsibility since he is still a child in a state of arrested development.

In wars and social upheavals ■ often happens that, since a savage knows no limits, he is appointed to jobs only a brute will perform. So John labelled such savages as Hitler, a barbarian, along with any other losers who make

slovakia, in 1938.

However . . . Churchill was a citizen, too—and when a citizen refuses to be conned, recognizes the barbarian as inherently incapable of productive effort, co-operation, or adaptation, the citizen's greater range of abilities can fairly surely destroy him.

The barbarian wants to fight for a living; he likes life only in those terms.

The citizen is a past-master barbarian; he's gone through that stage. He *can* fight—if he realizes that that is the necessary answer to the intransigent, self-centered, honorable-but-dishonest barbarian.

The great menace of the barbarian is that the citizen *can* adapt to the barbarian—and civilization, which depends on citizens, disintegrates shortly afterwards.

The Tribal type, a civilization can use; the tribal pattern individual will work, and work honestly and faithfully. He is not creative; he seeks the security of routine and tradition. But remember, these personality pattern types have *no correlation whatever with intelligence, race, color, creed, or physical shape*, because they are *individual* characteristics. (Race does enter—but solely on a statistical basis. Cultural evolution, remember, acts as a selective breeding mechanism, and produces a strong selection of statistics in the resultant group. Such a selected group will *not* show a Gaussian distribution, naturally!)

One can find a pure tribal-pattern individual with an I.Q. of 175, a professor at a University, where he is patiently, faithfully, and competently carrying on the highly intellectual traditions of his scholarly field. He's still a tribal type, however intellectual a tribesman he may be! He will have the virtues of loyalty, honesty, and patience—but will be entirely non-creative, and will oppose all suggestions of change in the traditions and rituals of the University or the field he is engaged in.

Or the highly intelligent tribesman type may be a chemist, doing quality-control analyses, checking to see that a name for themselves after a career of brutish exploitation.

A barbarian is simply an individualist. He thinks his own thoughts and implements his own programs. Being superior to the tribalist, he won't play their communal games so they reject him. He won't work with the citizens' committees by which they seek to enslave everyone to the common good, so he's considered unadaptable. But why should he adapt himself ■ systems set up for others, wherein he is just an unimportant cog working far below his natural capacities?

The barbarian, having little or no interest in the standards imposed by mediocrities goes his own way. And when a system serving only his inferiors ■ closing in on him, threatening his own liberty on behalf of those ■ whom liberty is only a frightening separation from whatever despotism they are used to, the barbarian rebels.

Throughout history, most of those who have broken new ground in science, industry, invention, the arts, exploration, warfare and social progress, have been barbarians. They were simply men who followed their own vision.

The citizen simply wants to fit into and serve or exploit whatever system he has. To him, the barbarian is indeed an uncooperative lout and even a social traitor. He realizes, often unconsciously, that the superior person, individualist, groundbreaker and natural warrior, is a threat to his own ambitions.

The citizen cries crocodile tears at the suffering of our millions ■ unwanted children. But he encourages more such births since some might survive to vote for him. Or maybe he has stock in a diaper factory. The barbarian doesn't need to exploit suffering inferiors to make his living.

At this time, while the central authority is still intact, the barbarian can only selfishly stock up for himself and his loved ones. But in the event of a nuclear war or total socio-economic collapse, the surviving barbarians will take over as a matter of course.

This takeover will be much like that implied in Ayn Rand's "Atlas Shrugged." Most of her lead characters are true barbarians. Like most of our founding fathers, her characters refuse to contribute to an exploitive system.

Whereas our barbaric founding fathers actively fought to overthrow the British exploiters of themselves and their fellow colonists, Ayn Rand's characters simply withdrew. Withdrawal is our only option at this point.

Withdrawal is simply a strategic retreat in the face of the citizens' overwhelming strength, backed up by their masses of tribalistic marching morons. We need neither the citizens locked into their monstrous establishment nor their tribalistic goons made worthless by a system needing fewer hands and dull brains.

In order to inaugurate the next step in the evolution of human civilization, which would be the systematic culling of social dependents and predators, barbarians must withdraw and consolidate their strengths. This will require relocating to rural areas and becoming increasingly independent of our doomed system.

As a barbarian, you might have some idea of taking over your territory after the central authority has collapsed. This is fine if you have a broad frame of reference and can supply your followers with the technology they'll need to rebuild.

Just being armed to the teeth will only make you a target. After all, weapons are so common that if that's all you have, you will just be another armed hooligan. You will have to be purposeful and useful to those you need in order to implement your own ideas.

The best system you can implement directly following the collapse ■ one which tests the ability of the competent to survive without interference. Thus, you would have to give those around you the choice of occupations which would make them independent of everyone, including you.

No better foundation for a system for developing the talents of barbarians,

the company product does in fact meet ASTM standards test #237-B-2, or the relevant MIL specs. Here, his inherent lack of creativity is one of the highly desirable features of his nature; when a man is supposed to check something against an established standard test, originality, creativity, and ingenuity are the last things wanted! The new, shorter, and easier test he invents may be wonderful—but it is *not* ASTM standards test #237-B-2, which is what the contract calls for!

A citizen could do the quality control job, because he can appreciate the necessity of the noncreative viewpoint, and adapt to it. He'll be uncomfortable, though, because in such work he'd be using less than his full potential.

The one who absolutely could not carry out the job would be the barbarian personality; being rigidly limited by someone else's orders is dishonor, it's intolerable . . . he'll break out because he *can't* work that way.

The menace of the barbarian lies in his intransigence, coupled with high intelligence, argumentative persuasiveness, and pleasure in fighting. The citizen, because he is adaptable, will gradually adapt to the barbarian's intransigent demands, because the citizen cannot continually fight off the barbarian and accomplish the productive things the citizen yearns to achieve.

The citizen fights only to accomplish; the barbarian fights to enjoy the fight and to win. In argument, the citizen seeks to find the truth—the barbarian seeks only to win. The barbarian has an intense sense of honor—and neither honesty nor truthfulness, morality nor ethics. But he will call upon the citizen to be moral, ethical, honest and truthful continually.

The barbarian well knows that the best weapon to use is one that can hurt your opponent—but which cannot touch you.

Until the citizen realizes that self-defense is not only an ethical right, *but also an ethical duty*, he will yield to the barbarian simply because he *can* adapt.

The simplest sign of barbarism is the characteristic that they will *demand*, on moral-ethical grounds, that they be *given* something they claim as rights, but will not accept that it must be *earned*, must be *worked* for. They will threaten to fight for it, and will fight for what they want—but will not work productively to earn it.

The essence of the barbarian approach was boiled down very neatly in Hitler's cry of "Guns before butter!"

Guns are to fight with; butter is fuel for hard work. ■

or individualists, if you prefer, is the 19th and early 20th Century science and technology known as low technology.

Low technology embraces farming, light industry, and cottage industry. Although producing plenty for the actual producers who can trade with other enterprising individualists, little real surplus would be generated.

(The overall layout for such a system is found in the five volumes of THE SURVIVOR. There are hundreds of trades and light industries easily implemented by the intelligent layman. You can use these ideas, mostly by barbarians of a few generations ago, to start your own dynasty. You can also put others to work duplicating the old processes).

The great surplusses generated by our wasteful and ecologically destructive system would no longer be there to be used by citizens to simply preserve the bodies of those born to no purpose. Initially, the weak and dependent would die off and only the strong and purposeful would prosper.

By the time society redeveloped and grew to a high level of agricultural and industrial productivity, future surplusses could go toward the betterment of the species. The savages will have died or been killed off. The tribalists who survive can be sterilized, as their issue is not only unimportant, but a drag on progress.

Citizen type children could be encouraged to excell at what they do and constantly expand their frames of reference. They should be taught their only social responsibility is to produce as good a product as they are capable of. Once they learn to adapt to the standards of excellence demanded by barbarians they will lose their identification with tribalists and savages.

Then there will be plenty for all who can earn it. There will also be plenty for those too lacking in ability to support themselves. But since social dependents will be sterilized, society's burden will be negligible and the species will gradually strengthen.

Within a generation there will be few savages and not many social dependents. With the gradual reorientation of the citizen types there should not be another citizen menace for several generations, if ever. Then, there will be such scientific and social progress that the cycles of growth and decay of civilizations could be replaced by an ongoing system of refinement of both man and his life support systems. Space science and its spinoffs could give the species lasting socio-economic benefits instead of the short-term economic benefits generated by wars.

When barbarism, or individualism, becomes the norm, your descendents will crew space ships and build cities out there. Only those who realize that life quality is all important and unproductive existence is a threat to the species will be considered fit to make decisions in the future.

American Shells for Guns

Scientific American—June 15, 1861

We have received a pamphlet written by W. W. Hubbell, Esq., of Philadelphia, in which he claims to be the inventor of the destructive explosive shell used in the American navy. He asserts that in 1840, he made a verbal agreement with Col. Bomford, chief ordnance officer of the United States, to introduce and manufacture his shell for the service, and that 100,000 have since been made. The agreement was to the effect that he should receive one dollar compensation for every shell made, but as yet he has never obtained any remuneration. Paixhan, the French artillery genius, who first introduced shell into naval warfare, preferred those of concentric form, and these are the kind now employed in all navies but our own. Hubbell's is an eccentric shell, claimed to be superior to those used in other navies, and it proved very destructive in blowing up the granite Bogue Forts near Canton, in China, a few years since, by our naval forces. Mr. Hubbell commenced his experiments with these shells in 1840, and on the 22nd Sept., 1842, he fired three 32-pound shells from the battery at Sandy Hook, by order of the Navy Department, in the presence of Commodore Wadsworth.

Formerly bomb-shells were all thrown by mortars —a short wide mouthed gun set at an angle of 45°. Those shells were thrown at a great elevation, and their range was obtained by different charges of powder in a back chamber of the mortar. Paixhan practically introduced the system of discharging shells horizontally from cannon, similar to solid shot.

Firearms And Rifle Breech Loaders

New York, Saturday, January 26, 1860

The subject of firearms has engaged much public discussion during the past few years, and it is now attracting more attention than ever. Nearly all Europe appears to be an armed camp. England has two hundred thousand volunteer riflemen in constant drill; and at home, the notes of warlike preparations resound throughout the land. For two centuries, the free yeomen of America and the sturdy Switzers of the Alps were alone distinguished for skill with the deadly rifle; but it has now become the weapon of all armies, and there is no nation which can claim preeminence in the skillful use of it. The first correct writer on the rifle was Robbins, an English soldier, who wrote upon the subject about a hundred years ago. He explained the defects of the smooth bored musket, described the principles of the rifle, pointed out its superiority, and declared that, by whatsoever army it was adopted, "wonderful effects would follow." The theory of the rifle is now generally known, and the advantages of this weapon are duly appreciated. But there are great and essential varieties of rifles, and, of course, all cannot be equally good. There are breech-loading and muzzle-loading rifles; there is the light English rifle, with its smooth tapering barrel; the heavy Swiss rifle, with its thick breech and muzzle; and the long heavy American rifle, with its octagon barrel. There are also very great differences in the pitch of rifle grooves, and other features which are far from being unimportant. On these points much has been written that is more discursive than instructive. J. Chapman, author of the "American Rifle," and Colonel Jacob, of the East India army, are perhaps among the best writers on this subject. [illegible] on small arms has also

The Independent Citizens Army

By Kurt Saxon

(This editorial is one I wrote for the front of a catalogue of my books ten years ago. It is just as true today as then and my attitudes concerning political charlatans and paranoids have not changed. I stated then as now that joining "Patriotic" groups and showing hatred for our government is counterproductive. Our politicians and Dept. of Justice are all too often incompetent but I have never known them to interfere in the legal activities of any individual or group).

Dear Friend:

You've probably been asked to join this group or that movement lest our country fall to the enemy. As times get worse you might be tempted. I was and I joined everything I could. In time, nearly everyone was named as the enemy. If we could only get rid of this bunch or that, we would be secure. In the meantime, we dedicated world-savers were nickled and dimed to a state of poverty by the heads of the outfit. But it was for *the cause*, you see.

Of course, *the cause* seemed to center in the hind pocket of whoever claimed to have the answers. Also, *the cause* was about 80% propaganda, 15% wishful thinking and maybe 5% action. But no accomplishment. In the meantime, nothing changed except for the worst.

I finally got fed up with supporting a bunch of paranoid bums and started looking for my own answers. I suggest everyone else start thinking for himself and cut loose from any similar groups taking away his time and efforts from preparing for his own survival and that of his family.

The political parasites would leave you ruined when the time of chaos comes. In that time, the enemies they name now will be in just as bad shape as everyone else.

So take their "enemies" with a grain a salt. You can't hurt "the enemy" and I'll tell you why.

If the enemy was any identifiable group it would be against the law to attack them. Threats or attempts in that direction bring in police, and on occasion, the FBI and ATF. Anyone who is really serious can't get far enough in his activities to do any damage to "the enemy" as a group. He will only be jailed, or most likely, just be put under surveillance as a dangerous political activist. At that point, he doesn't do anything because he doesn't dare.

After wasting years and money and effort against every group I imagined was the enemy I came to see them all as just mobs of people heading for the same chaos as the rest of us. Their activists who stood out were just loud-mouthed, frustrated malcontents like I used to be when I was brawling with them.

So I don't believe any group is "the enemy". I believe the problem is national and even world-wide degeneration. There are just too many people breeding dumber and more unfit offspring each generation. The more of such people born, the more unrenewable resources are used up and the more our planet is polluted so that fewer people can live on it.

So where does all this leave you? As things get worse you will be the target of moronic criminals, starving mobs and maybe even foreign invaders. Your neighborhood might be an island of relative plenty in a sea of chaos and famine.

When that time comes, the more people like you spread around the country, the safer our country will be.

In the meantime, the Law can prevent you from being effective against any named enemy. Soon, though, the Law will be helpless. They are hardly effective even now against criminals and the jobless, rootless wanderers whom you can neither fight not imitate at this stage of the game.

When these elements wear down the Law it will be *your* turn to howl. Then you can destroy those who threaten you. But not before.

been lately published in the London *Mechanics' Magazine*, by W. Bridges Adams, a practical engineer and writer on mechanical subjects. Some of his views are full of good sense, while others exhibit a want of thorough practical acquaintance with rifles.

European writers on firearms seem to be unacquainted with what has been done in America by our gunsmiths. The conical or elongated Minié projectile, which has become the favorite in Europe, is the old picket bullet used by American riflemen, with the addition of a chamber and plug in its stern. Adams' says: "All forcible expansion of leaden bullets within the barrel by the explosive action of the gas is a mistake—it wastes powder and alters the form of the shot into irregularities, tending to irregular flight." He thus declares that the expanding bullet is not reliable for accurate shooting. We have seen several experiments made with the expanding and the old solid picket bullet loaded at the muzzle, in which the latter always proved the most reliable. It must be acknowledged, however, that the expanding ball has its advantages in warfare. With it, a soldier can load his rifle as easily and as fast as a musket; and ■ it is not quite so reliable, it is better for rapid firing than the solid ball. But it has no other advantage than this; and above all things, certainty of striking should be the first object ■ firearms; quick shooting if we can, but accuracy by all means.

American first class rifles are the best in the world. The foreign Enfields, Whitworths and Lancasters are far inferior to them. The reason of this is obvious. Rifle shooting has been a favorite American amusement for a hundred years, and ■ has been a matter of national pride, as well as of security, to excel as marksmen. The greatest care and the highest mechanical skill have been called into requisition on the part of our gunsmiths to make perfect rifles, and they have been successful beyond all that Europe can boast. A Wesson, a James' or a Fish rifle is always a "dead shot" in the hands of American marksmen: the instrument, when in proper order, never fails.

At present, we believe that the muzzle-loading rifle, with the tight fitting conical bullet, is the most reliable, and the principles involved in its construction are few and simple. The barrel should be of the best close-grained cast steel, and its weight sufficient to give it stability. It also appears to be advantageous ■ have the barrel of an octagon form, and of the same diameter from end ■ end. When the charge expands in the barrel of a rifle, a series of undulations are produced, which operate to give irregularity to the flight of the projectile. The angles of the octagon rifle barrel tends to arrest these undulations. This was discovered long ago by our backwoods' marksmen; but this principle does not seem to be appreciated by most army officers, who have provided round barrels for their rifles. The size of the bore in rifles is a matter of convenience and choice. The larger the bore the greater proportionately should be the weight of the barrel, to give it stability. The interior of the rifle should be as smooth and polished as the inside of a steam cylinder, to avoid friction in the passage of the bullet. There ■ quite a difference of opinion as to the best length for rifle barrels. This is an important feature, because the pitch of the rifling is always in accordance with the length of barrel. The heavy, long western rifle, with its moderate spiral, is considered by many persons to be the most reliable; while others assert that a short barrel, with a slow starting spiral and an increasing twist towards the muzzle, is as reliable, and is preferable to the long barrel. The number of grooves in a rifle is not of much importance—three are better than a dozen—provided the bullet be made to spin properly; they should be as shallow as possible, however, to prevent windage. The German rifles have short barrels and a rapid twist. Colonel Jacob states that he found, by many experiments, that a barrel two feet long, with the grooves full and of a breadth equal to the *lands*, and giving a revolution once in three feet, was equal to barrels two and a half and three feet long. The muzzle of a rifle should be perfectly true; for if

So my advice is to gather a small group of like-minded friends and prepare. Collect knowledge, guns, raw materials and food.

Train together in relatively safe and legal ways. Join the National Rifle Association and local gun clubs. Attend gun shows and rifle ranges. Don't be too secretive about your group activities. Be open with the police. They won't approve, on principal, but so what? It's your country and since you don't intend to act until the police are helpless, it's no business of theirs.

Recruit a cop for your group if you can. He may keep you from making mistakes through ignorance of the law. And when he finally throws away his badge in disgust he will be one of your best.

Being fairly open in your aims will eliminate the paranoid fanatics, who are good for nothing anyway. Openness also keeps you pretty free from infiltraters. And you will be surprised at the things you can get away with which you now might think would land you in jail.

A perfect example of the kind of outfits I have been suckered by is the National Association to Keep and Bear Arms, (NAKBA). I single them out not only because they are a perfect example but because they asked for it. This way, they serve me even better as an example than as advertisers.

The following letter was sent to me by a person who claims to want a strong America. National Association to Keep and Bear Arms? Publishers of the Armed Citizen News? Yet, their head boy rejected an ad for the Poor Man's James Bond; the single book which would make his every member the ultimate armed civilian. And his reason? He didn't like my dedication in the sample copy I sent him.

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Publishers of the Armed Citizen News

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July 6, 1974

Mr. Kurt Saxon
Atlan Formularies
P.O. Box 430
Eureka, CA 95501

Dear Mr. Saxon:

Your request to place an ad in the Armed Citizens News was considered by the Board of Directors. After we examined the book, "Poor Man's James Bond", we did not feel it was acceptable because it gives plaudits on one of the front pages to Sirhan Sirhan and Lee Oswald among others. Both of these men are self-acknowledged MARXISTS. We do not wish to be connected with them in any way.

Thank you for the request.

Yours for God, Family, and Country,

Charles L. Adams

Charles L. Adams
P.O. Box 99
Redding, CA 96001

CLA:mm

"Affectionately dedicated to:

there is the least defect at the issue where the bullet leaves the barrel, shooting becomes mere chance work. Clark's patent loading muzzle—an American invention—has conferred a superiority for accuracy on all rifles furnished with it.

It is admitted that rapid loading is desirable, and that this is obtained with expanding bullets; but these are not reliable. But, then, are not accuracy and rapidity of firing combined in breech-loading rifles? The late Secretary of War, in his report, said: "I think it may be fairly asserted now that the highest efficiency of a body of men with firearms can only be secured by putting into their hands the best breech-loading firearms." This conclusion, it seems, was arrived at after a great number of experiments by army officers. There can be no question as to the ease and rapidity of loading breech-loading rifles, but they are not considered so accurate in firing as a good muzzle-loader. We have seen several trials of skill with the two kinds, in which the breech-loader usually failed; and yet we do not see why this should be considered a settled question. There ■ nothing in theory, and there should be no positive difficulty in practice, to prevent a breech-loading rifle from being made to carry as accurately as any other. We shall recur to this subject in a future article.

Projectiles For Rifled Cannons

Scientific American—Dec. 21, 1861

Messrs. Editors.—The important results, in a military point of view, which have been obtained within the last few years, by rifling the bore of cannon and adapting thereto an oblong shot or shell of a cylindrical-conoidal form, whereby the explosive force of the charge is made to give the projectile a very rapid rotary motion around its axis, counteracting the inequalities in the density thereof, producing a greater precision and a more extended range, are facts familiar to every one conversant with this subject. It is not a little remarkable, however, that after the improvement has been for a number of years successfully applied to small arms, that so much time should be allowed to elapse before its introduction into the construction of ordnance. In fact, most practical men, in the earlier progress of the improvement, are said to have looked upon the application as practically impossible (*vide* Renwick's "Elements of Mechanics," article "Projectiles"). This we take as another demonstration of the difficulties to be overcome in the progress of improvement, early prejudices must be surmounted, and it ■ hard to divorce those who may be wedded to their idols.

In referring to projectiles fired from rifled guns, we wish particularly to call the attention to the condition and results which pertain to the projectile from said improvement, namely, that shot or shell thus projected, will have its axis firmly held and preserved parallel to the trajectory or path in which it moves during its flight. This condition, it will be seen, forms the basis or foundation favorable to the application of our proposed improvements. If we assume, for instance, the velocity of the projectile to be 1,600 per second, and the rifled twist of the bore of the gun from which it is projected, to make one turn in ten feet, the said projectile would make about 150 revolutions per second on its axis during its flight. This rapid gyratory motion most evidently gives the mass of the projectile a *vis viva* that would require a considerable disturbing force to resist and overcome it.

Lee Harvey Oswald
James Earl Ray
Sirhan Bishara Sirhan
Senator Ted Kennedy"

You may not have my book yet so I'll explain. The Poor Man's James Bond deals with improvised weaponry. The dedication is to three people who used guns in assassinations. The idea is that their misuse of firearms could lead to gun controls which could cause sales of books on improvised weaponry to soar. (Ted Kennedy's gun control proposals have also stimulated interest in alternatives to conventional weapons).

To anyone with my book, the humorous intent is obvious. I don't believe for a minute that Adams saw anything wrong in my dedication. It is clear to me that in my book, he saw a threat to his little organization of paper-patriots. I'll explain this further along.

Adams and his sorry kind are all over the country. They prey on people who are worried about the excess of our creeping bureaucracy. They inspire fear of an imminent takeover, confiscation of guns, etc. Then they get you to hate your government and suspect its legally authorized law enforcement agents of being disloyal to the Constitution.

Always there ■ the idea that only they know the answers. If you support them you will be informed and organized and, just in time, they will lead you out of the dark into a new era of freedom.

As you continue to read their propaganda, you believe more and more things that don't seem reasonable to others around you. Finally you are out off, isolated from your fellow Americans. Then only Adams and his kind speak your language. Only they are left to protect you from the red agents and "ATF Gestapo".

So you keep supporting people like Adams. Nothing happens. This is because nothing is supposed to happen. You are just to keep buying subscriptions to The Armed Citizen News and making various donations as old "enemies" fade away and they dig up new ones so as to keep you excited.

But what's wrong with this? Really? What does it matter if he has you and a few other suckers supporting him? Well, it matters a great deal, for several reasons.

First, since he has cut you off from all appeals to reason, you represent a segment of the American population who has been politically castrated, neutralized. You hate your government and its law enforcement agencies. You are just as terrified of the FBI and the ATF (Treasury, Alcohol, Tobacco and Firearms) as any communist subversive.

And like the communists, you find yourself speaking only evil of our government and its agencies and even undermining their efforts to maintain order. The Kremlin doesn't need agents here any more.

The FBI and ATF rely for a major portion of their information on tips by alert citizens. If you see subversion being carried out in your community you are supposed to go to them and report it.

The Leftists are stockpiling illegal arms to a much greater extent than are the Rightists. People like you are in a better position to recognize such activities than most citizens. But if you hate and fear the FBI and ATF and refuse to communicate you intelligence you are helping the Left to arm against your own kind. That makes you a traitor.

But you may even believe that the dealer in illegal weapons is a patriot. If his weapons are illegal he is a criminal and a criminal's politics are no concern of yours or mine.

If you are confused about illegal weapons send 25c to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Ask for "Firearms Identification" Publication 674.

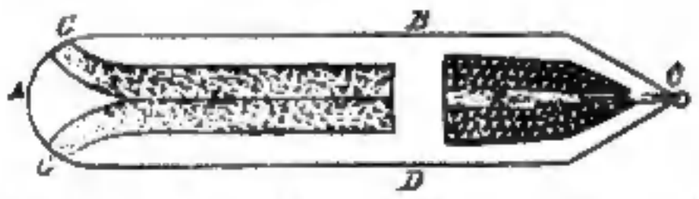
This booklet will show you what the Alcohol, Tobacco and Firearms agents are looking for when they quiz gun collectors. You can see that most of these weapons are about as dangerous to the user as to the intended victim.

They are mainly sawed-off shotguns and zip-guns used by punks in holdups and for plain murder. Hardly weapons needed to resist tyranny.

The range of the best constructed rifled ordnance, at the present time, I believe, is about five miles. Numerous devices are being made to improve the rifling of the bore of the gun and also the expanding appliances of the projectile adapted thereto, in order to secure precision of flight and to extend its range. The great resistance which it is known the atmosphere presents to cases of very great projectile velocities, will always tend, in cases where a single projectile force is applied (as in the ordinary mode of projection), very considerably to limit the ultimate range, and also to reduce the force of percussion at the intermediate points where the velocity is the greatest. The effect of this resistance, according to Hutton, reduces the flight of the projectile to about one-tenth of what it would be if the atmosphere did not interpose. The following proposed improvements are therefore designed to be applied to projectiles so as to compensate for the resistance of the atmosphere during their flight, and to preserve, as far as practicable, the initial velocity, and if possible to increase and accelerate the same. For this purpose two distinct modes are suggested, which, it is believed, may be used separately, or the two may be combined together as hereinafter described and illustrated.

The oblong projectile, constructed with the usual external appliances, to be fired from a rifled gun, must in both the modes of improvement here referred to, be formed or constructed with a suitable cell, chamber or barrel, in the tail or rear end of it, the same being made concentric with the axis thereof. In the first method referred to, I propose to fill the said chamber or barrel with rocket composition, so that after the projectile, thus prepared, shall be discharged from the muzzle of the gun, a new and auxiliary propelling force shall be made to act upon it, to counteract, in some degree, the resistance of the atmosphere, and thereby to preserve the initial velocity and force of the projectile during its flight. I have not as yet satisfied myself as to the most appropriate form or figure in the detail, which should be given to said chamber or barrel to answer most advantageously the purposes contemplated, but the general outline thereof, it is presumed, may be sufficiently illustrated and explained so as to be generally understood by the following diagram, Fig. 1, wherein A B C D, represents a longitudinal section of the body of a cylindrical-conoidal shot or shell, the external expanding portion thereof being omitted in the sketch. The chamber, E, in the head of the projectile may contain the explosive charge of powder, balls, &c., to be ignited by the cap on the nipple, C, when the same strikes any object. The chamber or barrel, F, above alluded to in the construction of the proposed projectile, may contain two or more rockets, or the composition thereof, packed therein, having their vents or chokes, terminating at G G. It will be understood

Fig.1



that these vents or chokes, whether two or more in number, must be formed and arranged so as to be at equal distances apart around the exterior end of the projectile, so as to preserve an equilibrium of action around the axis thereof. This inclined action of the inflamed gas on the atmosphere, to propel the shot or shell forward in its course, as here suggested, cannot sensibly be affected by the partial vacuum which is known to exist in the rear of a projectile, when in very rapid flight, as the action in this case would be toward the sides of the projectile, where there must necessarily be a full medium. In fact it will be seen that the point proposed for the action of the inflamed gas is such, that it must meet a volume of atmospheric air pressing inward from the sides of said pro-

Then there are the mortars, 75 Caliber machineguns, anti-tank guns and other souvenirs, impossible to supply with ammunition for a battle nowadays.

Most important are the Tommy Guns and illegal automatic M-1 and M-2 carbines, silencers and tear gas.

Fully automatic weapons are terribly wasteful of ammo and not nearly so effective as my legal, semi-automatic 11 shot shotgun, detailed in the Poor Man's James Bond. And why keep a silencer around when my book shows how to make one in a few minutes which you can use and throw away? As for stocking illegal tear gas; my book tells you how to make it for pennies out of glycerine and Sani-Flush. You can shoot it from a water pistol or nasal spray. It's just as good as Mace and although illegal, you can make it within an hour of its use and just throw it away when your need for it has passed.

As you will see from reading the booklet on firearms identification, gun lovers and those who keep guns for self-defense have no use for the kind of weapons the ATF agents are looking for.

Anyone who gets rousted by them asks for it. Thanks to people like Adams, the ATF victim appeared furtive, hostile, evasive, impolite and uncooperative. This will gripe the hell out of any Law officer anywhere in the world. You show hostility to a watchdog and you'll get bit. Show hostility to the ATF or FBI and you're going to get screwed over; I don't care what their training manuals say

On the other hand, if you are friendly with them and show them what you've got you will find they are really nice guys and you'll feel a lot more secure. If you cooperate and should unknowingly have something illegal they will just confiscate it and that's all. They have neither the time nor the inclination to frame you.

If you have something illegal which you really think is essential to your survival, bury it. The Poor Man's James Bond tells you how to beat metal detectors.

A visit by the Federal men may make you think you are the victim of an informer. You could have been sold out by some brainless punk you've been running with. People in nut groups are notorious for throwing each other to the wolves. But what usually leads them to you is your name on the mailing list of a group which is hostile to the U.S Government and its law enforcement agencies.

When they see you are a subscriber to monthly publications sent out by such organizations as the the National Association to Keep and Bear Arms, The National Socialist White Peoples Party, The National States Rights Party, etc., they see you as one who hates our government in general and the FBI and ATF in particular.

So if you are mixed up with some anti-government nut group, they just plain don't like you, friend.

And they didn't have to steal a name list to zero in on you. Any Federal law enforcement agency can monitor the U.S. Mails. That is, the names and addresses on any mail from any organization can be copied before it leaves the Post Office.

Any hostile group mailing out several hundred pieces per month can be monitored in this way. For instance, The National Association to Keep and Bear Arms mails out its paper without an envelope, bulk rate, Permit 697, name and address. What could be plainer? Even a postal worker knowing an organization's mail could monitor the names, and he might be working for the Kremlin. Who needs an organization's mailing list?

This monitoring is very selective since the FBI and ATF simply don't have the personnel to monitor every organization's mail. But if you subscribe to any periodical which preaches hostility to the ATF and FBI you can be pretty sure they know where you sleep.

Even so, it's not against the law to hate your government. So what if they have your name? So what if they even come around and talk to you?

They sought me out when I belonged to nut-groups. I found them entertaining. When a new ATF or FBI man was being broken in his buddies brought him around to me as part of his initiation. After I got through telling him about the state of the world he was never the same.

Okay, so a visit by the ATF didn't bother me. But what about you? If you have your own business and are a lone wolf and don't care what people think,

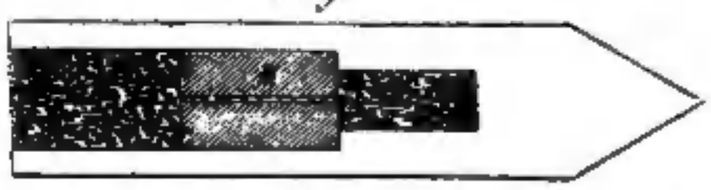
ectile towards its axis, to fill up and restore said void or vacuum as the projectile advances along in its course.

The effect of this proposed application to the projectile, when fired from a rifled gun, we think, must be obvious, if the rifled gun, simply by the force of the charge, can project a ball or shell, say four or five miles, as recent experiments at the Rip-Raps and other places have demonstrated; and, on the other hand, the ordinary military rocket (Congreve) of thirty, forty or more pounds weight, can be projected from a state of rest or quiescence merely by the propelling power of the composition used therein, with a range, it is said, of two or three thousand yards. Is it not plain and plausible, therefore, when these two modes of projection shall be combined together and made to act simultaneously on the same projectile as here proposed, that the result or effect thereof must be greatly increased, and per consequence, that the shot or shell must be sent forward in its flight with greater force and to a greater distance than could possibly be accomplished singly by either of the two modes of projection. The oblique action of the inflamed gas, as here proposed, it is believed, would also be efficient, in some degree, as a propelling power whatever may be the relative velocities of the projectile, and that wherewith the inflamed gas issues from the vents. The construction of the vents or chokes, G G, in addition to their being arranged for propelling the projectile forward in its course, as above suggested, may also be made to terminate at the exterior surface of the projectile, tangentially thereto, so as to discharge the inflamed gas, in a direction contrary to the intended rotation of the projectile, and thereby renew and keep up the gyratory motion of the projectile around its axis. It is suggested that probably this mode of action might be used advantageously with projectiles of an oblong form, fired from smooth-bored guns, so as to give to them nearly the same accuracy and range with the rifled guns.

The above embraces the first method proposed for the improvement of projectiles. Experiments are said to have been made to fire rockets from mortars, howitzers, &c, but with very partial success. The flight of rockets, even when thus projected, are very uncertain and not to be relied upon. In the arrangement above proposed the rocket principle is applied as an auxiliary to the most approved projectile of the present day, viz., those fired from rifled guns, and when properly constructed and applied must certainly improve the range or force of projection without in the least interfering with the accuracy thereof.

In the second method proposed for the improvement of projectiles, in order to insure more effectually an increase of action of the new auxiliary impulses to be applied to the projectile during its flight, I propose to use the explosive force of gunpowder to drive it along in its course. For this purpose the chambers or barrel on the rear of the projectile may be formed and loaded, as shown in Fig. 2, wherein L is a charge of gunpowder, H a heavy cylindrical shot or plug, with touch-hole and priming therein, and F a common fuse, or the rocket composition as above suggested.

Fig. 2



With reference to this proposed arrangement it will be understood that after the shot or shell, thus prepared, has been discharged from the gun, the fuse or composition powder, F, will thereby be ignited, and during the flight burn down to the priming in the plug, H, and thus explode the charge, D. The size of the fuze, or quantity of composition, must of course be timed and regulated so as to cause said explosion to take place at the most advantageous point in the

these agents are a welcome break in the day's activities.

Actually, a routine questioning is usually friendly and doesn't attract attention unless it's done by a particularly dim-witted agent. But if you are on their hate list, that is, if you are affiliated with a group they consider hostile to the government, they can be very nasty.

First, they stop off at your local police precinct. They tell the police what they suspect you of and get whatever the police have on you. The police then promise to keep an eye on you and the agents come over to your place. If you are home it's not so bad. But if you are away at work and they flash their badges to your boss and lead you to a back room for a talk, you won't need to worry about promotions from then on.

If the worst happens and the system starts breaking down so everyone knows it, the camps will be activated. Then the agents will begin rounding up everyone on their hate list, whether on the political Left or Right. If you are on their active list you'll wind up in a concentration camp just like the Japanese Americans during the War. They'll treat you well but a concentration camp is still a concentration camp and you'll be out of all the action, maybe for years.

The best way for you to avoid this is to steer clear of all nut groups and anti-government organizations. If you have been suckered into becoming a member or taking a subscription you can cut loose easily.

Just write the goonies a letter telling them to cancel you subscription and take you off their mailing list. Xerox the letter and send the original by registered mail with a request for the return of the signature of the addressee. That way you can show you have dumped them and you'll be okay.

You might think that cutting loose from them would also cut you off from valuable information. But these paper patriots give out only propaganda; no useful information. They're not worth getting yourself put under surveillance for.

Take The National Association to Keep and Bear Arms (NAKBA) for example. I'd never heard of them before a friend sent me four copies of their paper recently. It was pretty kinky and anti-everything but I figured it would be a good advertiser for my Poor Man's James Bond, since they claimed such an interest in a well armed citizenry.

After they rejected my ad I judged their paper in a different light; biased, certainly, but still accurate. Then it wasn't just an eight-page rag put out by a bunch of paranoid fanatics. I saw now it was a rip-off organization promising action but delivering helplessness instead.

What do you get for your $7.00 membership in NAKBA? A dozen foolishly written eight-pagers telling you how vile and degenerate your government is. You are also expected to believe that the government is going to come and take away your guns any day unless NAKBA keeps up its patriotic fight in your behalf.

There is little variety in their paper; no relief from preaching and warning and keeping score on which politicians are traitors. For laughs, I think, they show an old character riding a horse and giving speeches on the same drivel covered by their paper.

For three dollars more, $10, you can get a membership in the National Rifle Association. You also get 12 $1.00 issues of the American Rifleman.

For years, the NRA, with about a million members, has effectively stopped every restrictive gun law dummies like Ted Kennedy and Birch Bayh have tried to put through Congress. And the NRA's mailings aren't monitored.

This is because the NRA is not a political organization. They know how to be *for* guns without being *against* the government or its lawmen.

Their publication, the American Rifleman isn't the only such newsstand publication. There is Gun Week and dozens of different magazines on guns and your rights concerning them. Yes, friend, there are alternative sources of information, and better, no further than your nearest newstand.

I wrote futher back that Adams considered The Poor Man's James Bond a threat to his organization. I'll show you why this is so.

Adams is working a deal whereby he has a lot of people terrified that without his help their guns are going to be confiscated. No one wants to be defenseless so he gets followers.

So along comes me with The Poor Man's James Bond. I love guns but my

range thereof. It may require probably, in the first instance, some little skill and practice in preparing and loading this projectile, in order to avoid every possibility of danger of its exploding within the bore of the gun. The cylindrical plug, therefore, should rest and abut on the shoulder of the chamber, L, and fit the barrel, F, as close as practicable and if necessary, may be packed and luted so as to be perfectly air-tight. The fuse, F, to the same end, may be rammed and packed directly into the barrel of the projectile and thus avoid the porosity of the fuse cord.

The action or reaction of the explosive force of the charge, L, as here proposed, must evidently give a powerful impulse to the projectile, which is at the time, moving with a very rapid velocity. To appreciate the amount of this reaction, it will be understood that at the time of said explosion the plug, H, is moving with the same velocity and direction as the projectile itself, and hence must have a momentum equivalent t.. its weight and velocity. The explosive force of the charge, L, therefore, to drive said plug out from the barrel of the projectile, must resist and in a measure overcome this said momentum. For example, if the force of the charge, L, was sufficient to give a velocity to the plug (when fired from a state of rest) equal to the velocity of the projectile at the time of the proposed action, it is evident the two forces or velocities would counteract each other, and the plug would fall out of the end of the barrel, as it were, perfectly dead or void of all motion, the gyratory motion of the projectile alone excepted.—Hence, as action and reaction are always equal, the reaction of the explosive force, in this case, to accelerate the velocity of the projectile and drive it forward, would be nearly equivalent to the effect of said explosion acting on and against a solid and stationary body. This reaction on the projectile being in proportion to the momentum of the plug, we may make the plug as large as practicable, to fit the bore of the barrel, so as to obtain the greatest velocity possible. When the projectile is arranged to carry a shell, carcass or the like for bombardment, the loss of weight therefrom by the abstraction of the plug, &c., from the body of the projectile would not be objectionable.

The above illustrates the mode proposed whereby one single explosive impulse may be given to the projectile during its flight, to increase its velocity and range. It is believed practicable, however, by increasing probably the length of the projectile and making the size and power of the rifled guns suitable thereto, to multiply the number of auxiliary impulses to the projectile, at pleasure. Thus in Fig. 3 is shown an arrangement whereby three successive impulses may be given to the projectile during its flight. H H H represents the several plugs, L L L

Fig. 3

the charges or gunpowder, and F the fuse or composition, as before mentioned. In this arrangement the primings may be the fuse or composition powder, which burns slower than gunpowder, so that the explosion of the several charges, L L L, may not be instantaneous, but in succession at certain intervals to be regulated by the quantity and quality of the priming. When a power is constantly acting on a body in motion, as gravitation for instance, the velocity of the body becomes uniformly accelerated. In the case of the projectile before us, after the same should be projected from the gun, the power proposed to act thereon, would not of course be a constant power, but one acting at certain very small intervals of time, the effect therefore would be analogous, and each new impulse would tend to increase and accelerate the previous velocity of the projectile.

book details alternatives, improvised weaponry anyone can put together no matter what kind of people are in power. After all, if you have a gun, you are simply a man with a gun, no better than another man with a similar gun. But with The Poor Man's James Bond, you are an army.

Keep your guns if you can, but be assured that if you should lose your guns, The Poor Man's James Bond would make you even more dangerous to an enemy than if you only had guns.

This is why The Poor Man's James Bond is a threat to Adams and all the other paper patriots. If you have my book you don't give in to the paranoid fears of confiscation. With the Poor Man's James Bond you don't need their help. You can be independent of paper leaders. You can't be disarmed as long as you have my kind of knowledge.

Even so, let's examine this confiscation threat. Such nonsense has been bandied about for years by people like Adams.

But opposing this threat are the Winchesters, Remingtons, Smith & Wessons on down to the manufacturers of the little Saturday Night Specials. Then there are the international dealers who supply us with our Mausers, Lugers, modern Carl Gustaf Sportsters and the companies who scrounge every battlefield on earth to bring us our love objects.

I'll bet they enjoy scare propaganda, hoping it will panic us and make us rush out to buy more guns. And we do. As far back as 1970 the National Rifle Association estimated that there were 200 million guns in civilian hands in the U.S. By now it's probably 50 million more. Most Americans who will own a gun want several.

Guns are a multi-billion dollar business each year and Americans love guns. American civilians own more small arms than are possessed collectively by all the armies and other civilian populations on earth. That's the way it ought to be and that's they way it's going to stay.

They could no more confiscate our guns than they could confiscate our tobacco or our booze. There is just too much money involved. Too many gun lobbiests haunt the Senate.

But just for the fun of it, let's say the government should start clamping down on our gun freedoms. The first act would be registration of all firearms. Most gun owners would simply deny that they had any guns, or they would report them stolen. Very few Americans would register their weapons on order. If a man had 20 guns he might register two. He would bury the other 18.

Americans simply will not be seriously hassled about their guns. This country doesn't have a big enough army to forcibly collect our guns. And as far as giving them up on orders from ATF agents, forget it.

The Nazi would say, "Those niggers armed to the teeth I ain't giving up *my* weapons so up yours and White Power!" The Jewish Defense League: "Me give up *my* weapons with those Nazi bastards all over the place? Never Again!" The Black Panther: "Them honky-Klan muthas ready to shoot my ass off and you want my artillery? Power To the People and Sieze the Time. Up against the wall, pigs!"

Then of course, the ensuing black market in guns would make our criminal class the wealthiest element on earth. They, alone, would be sufficient to make sure that everyone had a gun who wanted one, or two, or three.....

So registration is a farce and confiscation is an impossibility. The rank and file would not cooperate and the fanatics would start shooting.

So here you are, a citizen in the most violent country in human history. You're sorting yourself out and finding your place in this great Independent Citizen's Army. You've come a long way and you're getting ready for the revolutions and chaos ahead of us.

Now once you've progressed beyond the nut groups, the paper patriots, the propagandists, you are a lot more aware of things. Instead of wasting your energies through a bunch of paranoid jerks, you can now join legitimate gun clubs and such. Then you won't feel alone and helpless *like you did when* the goonies had you isolated.

You can be sure your name won't get on some ATF hate list. I don't show my mailing list to the authourities. They would be of no value to the government, anyhow. This is because interst in such subjects is shared by most

How far it would be practicable to project a shot or shell with this proposed arrangement, may probably be calculated by some of the known formula in gunnery; its solution, however, would be most satisfactory by a few practical experiments. The projection of shot or shell beyond the limits of vision may at first appear of doubtful utility; we believe, however, that when the same is regulated and directed by the rigid rules of topography and trigonometry, there would be many cases where the same would be found highly useful and efficient. The improvement, however, it will be readily understood, which has the power to project the shot or shell to the greatest possible distance, must necessarily have power to strike nearer objects with the greatest possible force. The rapid introduction of steel-clad armor to vessels of war, and the impunity with which they can face and defy the most powerful ordnance of the present day would seem to demand some improvement in the force of projectiles in order to oppose and resist them. In all new inventions, should imperfections exist, practice will generally point out the defect and supply the remedy.

The barrels or chambers in the projectiles above proposed, as we have already stated, should be made concentric with the axis thereof. The recoil of a gun being known to be always in the line of the axis of the bore thereof, the proposed explosions in the projectile cannot therefore deflect the same from its intended course or aim. In addition thereto the rapid gyratory motion of the projectile, or its *vis viva*, tends also to counterpoise the inequalities in the density of the projectile and the component parts as herein suggested, and also to resist the inequalities, should they exist, in the explosive action of the charges therein.

CHARLES POTTS, C. E.

Trenton, N. J., Dec. 2, 1861.

Trenton, N. J., Dec. 2, 1861.

[We publish the above communication as it is written, but we must inform Mr. Potts that a vacuum in the rear of his projectile would not prevent the rocket composition from propelling the missile forward. If the composition were in a closed chamber, the gases resulting from the combustion would press against the walls of the chamber equally in all directions; but if an orifice is made in the rear by which the gases may escape, the pressure in that direction is removed, and as the pressure against the opposite wall of the chamber continues, the projectile is driven forward. A Barker mill or an Avery engine will run in a vacuum.—EDS.

Americans to some degree. Millions have had military training and even in guerilla warfare. An interest in improvised weaponry is just a natural outgrowth of a normal interset in guns.

Besides, book dealers' mailings are irregular and monitoring campers and hunters would be a lot more tedious than monitoring anti-government types. For these reasons alone, book dealers' mailings would not be monitored.

Nut groups, however, with their regular mailings of hundreds or thousands of easily recognized pieces, are easy to monitor. An agent has merely to go to the Post Office on the day the goonies unload their mailings. He just sits down and works away at the stack until he's copied down every name and address there.

So I repeat; just cut loose from any nut groups. Be your own man. Get a few friends together and map out your own neighborhood defense program. Subscribe to publications like The American Rifleman and Gun Week. Buy books on military science, improvised weaponry and survival. Store food, weapons, ammo and chemicals.

Investing in such commodities is much better than keeping your money in a bank. They are certainly better than silver. When the chips are down you couldn't get a can of beans for a ton of silver. Also, hoarding silver just invites robbery. One the other hand, bullets of all kinds can and will be used for barter.

A man with a closet bullet factory can insure himself of everything he wants when the crash comes. Buy reloading equipment and the overall components for various kinds of bullets. With a good stock of bullets you can always trade them for what you don't have and also use them to defend yourself and your family.

In your preparations for survival, always keep legality in mind. It would be a pity if you planned so well and then get thrown into the pound for breaking the law. That's why I stress legality so much.

If you have any illegal weapons you think you can't do without, I repeat, bury them, preferably in a place where, if they were found, you could deny any connection with them. This also applies to legal weapons you might refust to register.

It is legal to store chemicals, which when mixed, become explosives. It is very illegal, and very stupid, however, to make explosives now and keep them around.

In case you didn't realize it, all the books I list are legal in fact, all books are legal to own, unless they are stolen. The Poor Man's James Bond is simply knowledge. The fact that the application of that knowledge would surely be illegal now, is beside the point. Feel free to buy it or any other such books on improvised weaponry or military science.

I leave you with this: It may be right to deplore all the arming going on around you. But while you are deploring it, just make sure you are better armed than they are.

Improved Gun Lock.

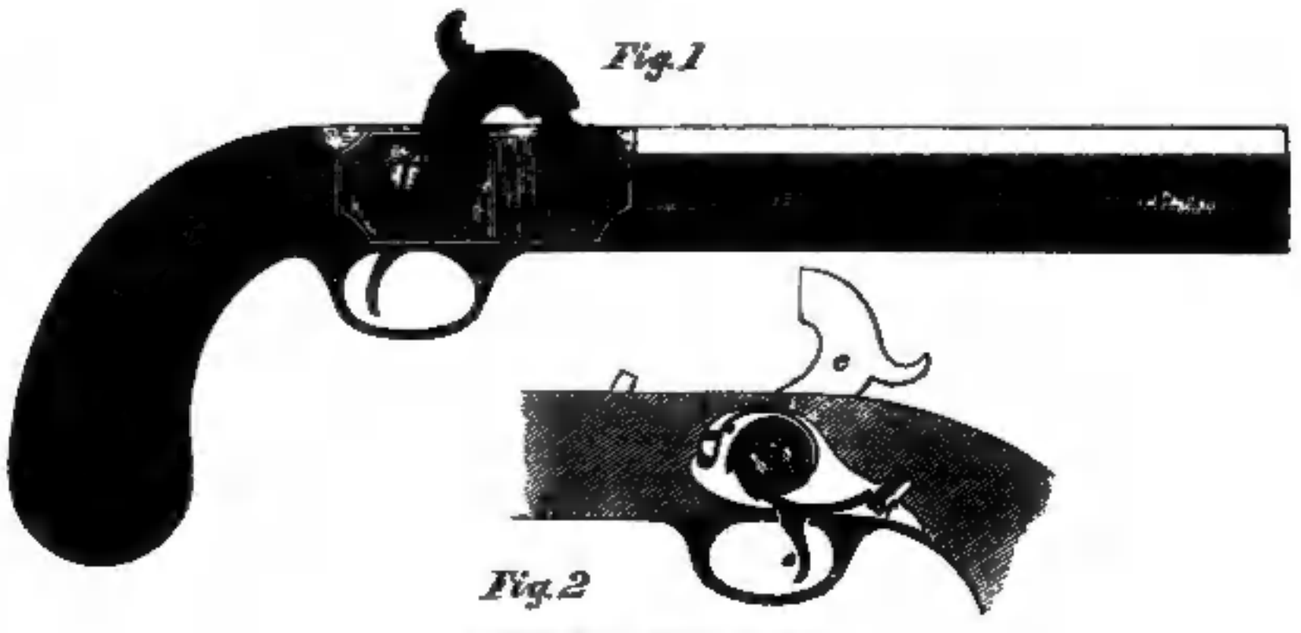
The Scientific American — July 1861

The accompanying engravings represent one of the simplest and most compact gun locks that has yet been devised.

The main spring, *a*, is coiled around the shaft, *b*, to which the cock, *c*, is rigidly secured; the tumbler, *d*, being slipped upon the same shaft, and held in place by a set screw. This mode of securing the tumbler enables the sweep of the cock, or length of arc through which it moves, to be varied and adjusted so as to give a blow of any force desired. The trigger, *e*, is pressed into the notches in the tumbler, by a spring, *f*, which may be spiral, as represented in the cut, or of the usual straight form.

The manifest advantages of this lock are its exceeding cheapness, compactness and simplicity. It is easily taken apart and put together, and if the mainspring or either of its other few pieces should be broken, it could be quickly and cheaply replaced.

The patent for this invention was granted April 30th, 1861.



HILLER'S GUN LOCK.